Registered at the G.P.O., Sydney, for Transmission by Post as a Newspaper. Published Weekly.

THE

MEDICAL JOURNAL OF AUSTRALIA

(With which "The Australasian Medical Gazette," and "The Australian Medical Journal" are incorporated.)

The Journal of the Australian Branches of the British Medical Association.

VOL. II.—5TH YEAR—NO. 9. SYDNEY: SATURDAY, AUGUST 31, 1918. PRICE 6D.

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BY

GEORGE LUYS, Former Interne, Hospitals of Paris; Former Assistant in the Dept. of Urinary Diseases at the Lariboisiere Hospital; Laureate of the Faculty of the Academy of Medicine, Paris.

Translated and Edited with additions

by

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THE MEDICAL JOURNAL OF AUSTRALIA.

VOL. II.—5TH YEAR. SYDNEY: SATURDAY, AUGUST 31, 1918. No. 9.

THE CONDITIONS FOUND IN AMPUTATION STUMPS AND SOME NOTES THEREON.

By **A. T. H. Nisbet, M.B., Ch.M. (Syd.),**
Captain, Australian Army Medical Corps; Radiographer, No. 2 Australian Auxiliary Hospital.

Patients usually arrive at an orthopædic hospital, where they are to have their artificial limbs fitted, some months after receiving their wounds. The first operation has probably been of a guillotine nature, and usually at least one re-amputation has been performed.

The operative measures now needed before an artificial limb can be fitted may be classified under three heads:—

1. Complete re-amputation.
2. Removal of the scar at the end of the stump.
3. Removal of sequestra and large exostoses.

It is due to this third possibility that an X-ray examination is asked for in the majority of cases. As a result, practically all stumps examined are in a septic condition, varying from a small sinus in an otherwise perfectly healed stump, to large open post-operative wounds, exuding quantities of pus as the result of re-amputating a septic stump.

The most common form of sequestrum comes from the pieces of bone of a comminuted fracture which were completely detached at the time the man was wounded, and are now lying in the soft tissues amid much sepsis.

According to the size of the bone, a longer or shorter period is necessary for a sequestrum to make itself evident. The bone which needs the longest time is naturally the femur, which takes from six to ten weeks before any sequestrum is noticeable, let alone completely separated. The time required for separation seems to vary considerably, which variation may be due to:—

1. The amount and virulence of sepsis present.
2. The physical condition of the patient.
3. Damage or partial separation of fragments of bone by original pieces of metal which caused the wound.

Of these, the first is by far the most important, and in these septic cases it seems probable the surgeon has had to lay bare the bone some distance above the line of saw cut, with the result that after the periosteum has been replaced and the flaps returned, the end of the bone has not received the usual amount of nourishment by way of the periosteum, and so has been unable to combat the invasion of septic organisms, and bone gangrene has set in. The size of the sequestrum will vary according to the amount of bone overcome by the bacterial invasion, which may be from the smallest crumb to a complete "ring sequestrum." The entry of organisms into the lower end of the bony stump is materially assisted by both the periosteum and the surrounding tissues being in a bad septic condition. One can hardly expect the bone to remain unaffected if it is virtually lying in a pool of pus, even though at the time it may itself be healthy. Once the protecting sheath of the periosteum is overcome by the invading organisms, it is an easy matter for the bacteria to penetrate into the bony tissue by way of the minute canals in the compact layer. The ring sequestrum tends to bear out this theory of septic invasion. It usually forms at the end of those stumps which have been very septic, and is a complete circle of dead bone, which becomes in time completely detached from the end of the stump. The upper end, on removal, is jagged, and fits into a corresponding jagged surface of the healthy bone. The lower surface is a clean saw cut, made when the previous amputation was performed.

The X-ray picture of a sequestrum may show one or more of the following points:—

1. There is a lighter area surrounding the sequestrum, denoting pus, and this tends to throw into greater prominence the density of the sequestrum.
2. The dead fragments of bone are more opaque to ultra-violet rays than normal bone, and thus throw a deeper shadow on the plate.
3. Situation is always close to portion of bone previously damaged, either from disease, wound or surgeon's saw.
4. Shape and size may vary from the almost impereeptible crumb to a piece two to three inches long.

The peculiar opacity of dead bone is well seen in plate Number I., which shows a sequestrum comprising the whole of the *os magnum*. On looking at this patient with the screen, the first thing that was visible was a dense black object lying amidst the carpal bones. A small skin incision was made by the surgeon, and the bone in its entirety easily removed with a pair of dressing forceps.

It is only when a piece of bone is completely necrosed that this density is marked, and the sequestrum lies free.

It is the opinion in this hospital that no sequestrotomy should be performed until the piece of bone has completely separated, and can be picked out without injuring any of the healthy bone. By this arrangement no healthy bone, which can often be ill-spared, is removed from the stump, no bone which is really part of the sequestrum, is left behind; the patient undergoes a much less severe operation, suffers practically no subsequent pain, and makes a better recovery. The sawing through of a septic stump to remove a partially separated sequestrum invites the bone to sequestrate still further, and it is in these septic re-amputations that the ring sequestrum usually forms.

The radiographer must be able to tell the surgeon definitely whether the necrosed piece of bone has separated or not. If there is any doubt about it, it

is better to let the patient wait a week or a fortnight, and then to examine the stump again and to compare the plates, noting if there is a more definite line of demarcation in the last plate. A sequestrum which has completely separated, ought to show one or more of the following points:—

1. It may not lie in accurate alignment with the shaft from which it has separated, and is often tilted to one side; this could only happen if the piece of dead bone is lying loose in the tissues.
2. If completely separated, there is practically always noticeable a line of lesser opacity between the sequestrum itself and its parent bone.
3. A larger amount of new growth sometimes makes it difficult to determine whether a sequestrum has separated, in which case comparison plates at intervals must be taken.

The radiogram does not always differentiate between one large sequestrum and several accurately fitting pieces. For this reason it is important that the surgeon should see that the piece of bone removed corresponds roughly to the size of the sequestrum on the X-ray plate. One large circular sequestrum may hide a smaller one from view, even though two plates be taken at right angled planes.

The value of taking two radiographs, whenever possible, at right angled planes cannot be overestimated. If a radiograph be taken in one direction only, and gives a negative result, the radiographer has no right to say there is no bony abnormality.

The hardest sequestra to find are the small pieces which may occur after a wound of the tarsus. Here small crumbs of dead bone seem to lurk in the middle of the foot and about the calcaneus, and it does not matter how the radiogram is taken, there will be normal bones of some thickness superficial to and hiding these sequestral crumbs or patches of unhealthy bone tissue.

In these cases the introduction of a probe into the wound before the X-ray examination is made, may give valuable assistance by showing its direction, and often will bring into prominence some small portion of diseased bone which would otherwise be missed.

Within reasonable limits, the depth of bone below the surface is no determining factor in the formation of sequestra. Naturally, if a circular amputation has been performed in the field and the retracting soft tissues have left anything up to 7.5 cm. of bare bone, this bone, having insufficient nourishment, must sequestrate. Otherwise the deeply embedded upper third of the femur is just as likely to become necrotic as the subcutaneous lower end of the tibia. It may be taken that under ordinary circumstances, a clean re-amputation with primary union means that no sequestra will occur. Just as the depth of the bone beneath the skin bears no relation to the tendency of the bone to become necrotic, so no one part of the bone has any greater tendency to sequestrate than any other part. This latter fact is a strong argument against unnecessary re-amputation at the seat of election, and thus robbing a man of 15 to 25 cm. of perfectly good limb because it looks blue and feels cold, especially as limb makers these days do not insist on the necessity of an end-bearing stump.

Plate No. 2 is a picture of 21.5 cm. of lower limb after it has been severed in order to get a stump at the seat of election. The leg was septic at the time, and as a result, the wound became septic despite the distance from the original stump. The post-operative X-ray picture shows a typical sequestrum lying in the tibia, the removal of which was all that was necessary to allow the leg to heal, and give the man a limb with far more leverage and stability, although not end-bearing.

Often the writer has noticed, in a perfectly healed stump, pieces of dead bone which were apparently giving no trouble whatever, and were lying quiescent in exactly similar manner to the pieces of metal one so frequently comes across. In these cases, there seems to be no justification in removing these perfectly aseptic sequestra. If, however, a stump is septic and refuses to heal, the smallest crumb of dead bone will keep the wound open indefinitely. These minute sequestra may be almost dust left behind by the surgeon's saw. Some apparently remain healthy, but if any die, then these dead fragments must come out in the pus, or the bone be curetted to remove them.

Another feature, only shown by X-ray examination of these amputation stumps, is the extraordinary frequency of new bone formation. These exostoses, or "spurs," as they are colloquially called, are composed of soft, ossified new bone, may grow to any shape, and may be as long as 5 or 6 cm. The most common are:—

(*i.*) General enlargement of the stump of the bone; (*ii.*) one or more long, thin outgrowths at various angles into the soft tissues; and (*iii.*) the formation of new bone, which joins the tibia and fibula, or ulna and radius, at their stumps.

These outgrowths of new bone throw a very light shadow when illuminated by X-rays, on account of the softness of the bone and the incomplete calcification. Indeed, if the tube is particularly hard, these formations may be completely missed. When these exostosis are cut through with a saw, they are found to be composed of very soft bone of a very crumbly nature, as though they consisted of an osseous cartilaginious tissue at the stage of bone formation, when it might be said that the last piece of cartilage had just turned into bone, yet the bone in itself was so soft that it could almost be cut with a knife. This new bone, as would be expected, is packed with small blood vessels and bleeds freely. The hæmorrhage is difficult to stop on account of the crumbly character of the bone. The surgeon must be careful not to leave behind small, free fragments, which are likely to necrose and form sequestra.

These exostoses seem to grow only where there is some form of chronic irritation present. The most

FIGURE I.
Complete Sequestrum of *os magnum*, referred to in the text.

FIGURE II.
Long Sequestrum with New Bone Surrounding, as described in the text.

FIGURE III.
Large Sequestrum Separated, almost surrounded by new bone.

FIGURE IV.
Large Sequestrum of Tibia and Small Sequestrum of Fibula.

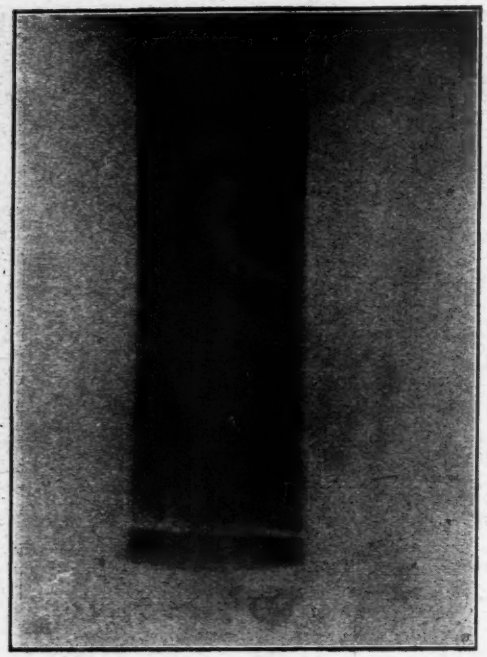

FIGURE V.

Ring Sequestrum, Due to Virulent Sepsis Milling the End of the Bone; came out as a complete ring.

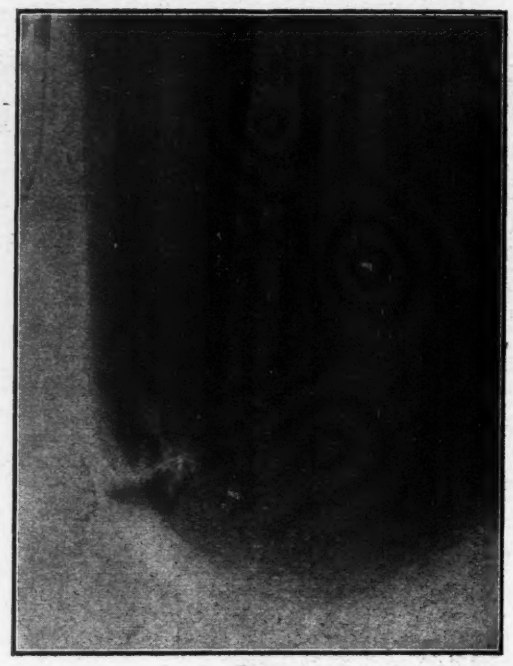

FIGURE VI.

Detached Sequestrum; Exostosis in Fibula.

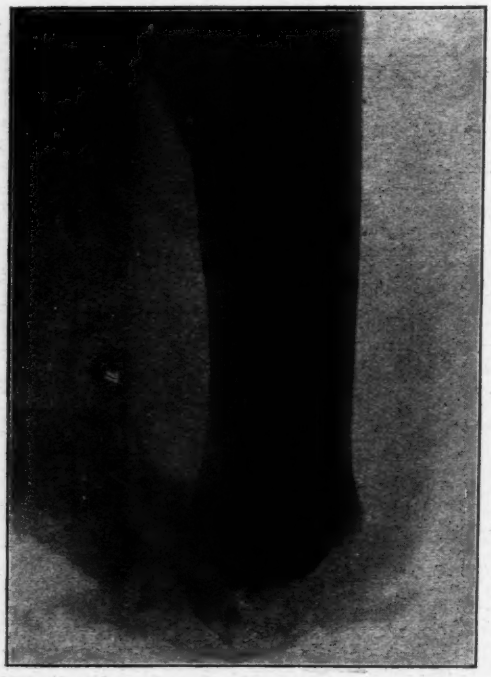

FIGURE VII.

Peculiar Form of Sequestrum.

FIGURE VIII.

Sequestrum Lying Between the Patella and the Shaft of Femur.

FIGURE IX.
Three Sequestra in Centre of Bone. Note the clear area, denoting pus.

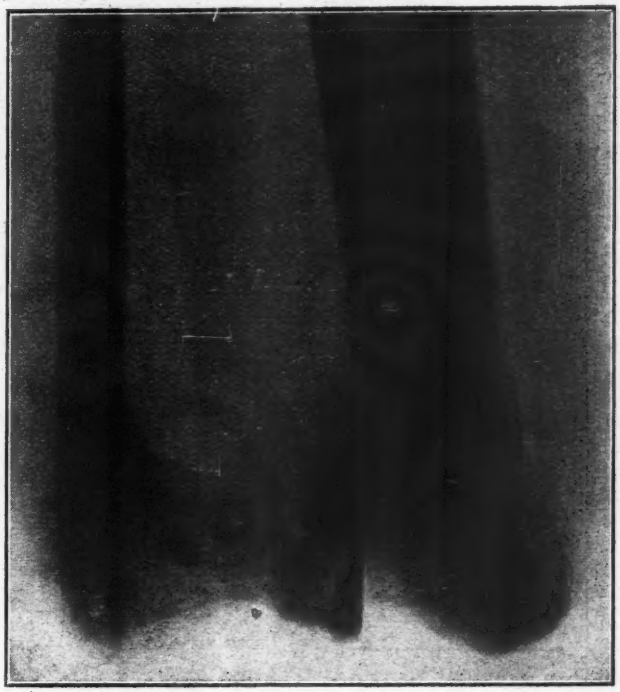

FIGURE X.
The Plate shows (*i.*) Sequestrum Separated from the Tibia; (*ii.*) Large Amount of Exostoses, caused by irritation of the sequestrum. The new bone is forming a bridge between the tibia and fibula, as well as growing up along the shafts of the bones.

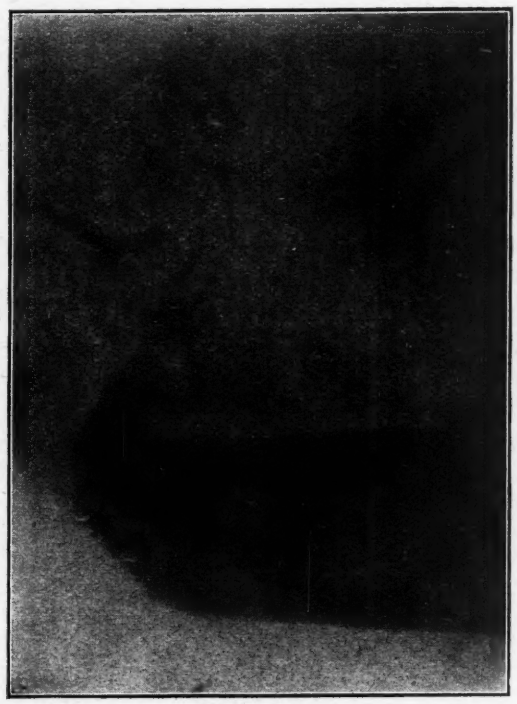

FIGURE XI.
Long Form of Exostosis, likely to cause trouble in fitting stump.

FIGURE XII.
Common Type of Exostosis.

FIGURE XIII.
Downward Growth of New Bone; the most awkward form to fit with an artificial limb, and the one practically always excised.

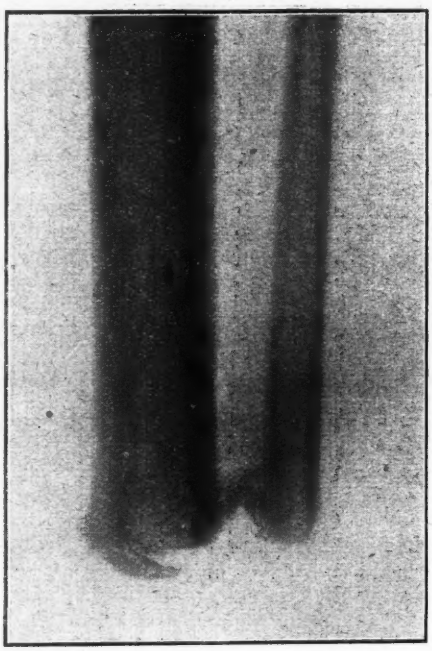

FIGURE XIV.
The End of the Tibia Shows a Condition Produced by the Surgeon Making Two Saw Cuts in Different Places. It is not produced by a sequestrum.

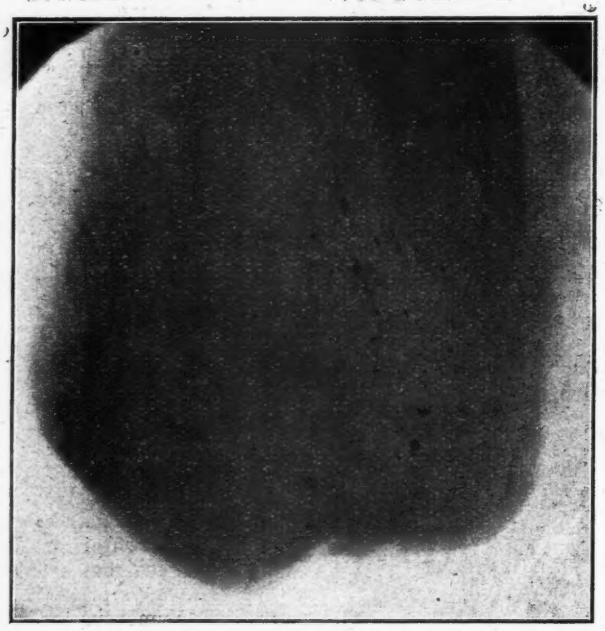

FIGURE XV.
The Only Conical Stump Seen in Over 200 Cases Examined by X-rays.

common form of iritation is sepsis, due to the presence of one or more sequestra. The next is abscess forming from any cause, while a fall on the stump, with consequent periostitis and a badly-fitting artificial limb, also contribute to the production of exostoses. Whenever in recent amputations these exostoses are present, it is a certain indication that there is, or has been quite lately, some trouble with the stump.

It does not follow that the larger the sequestrum, the larger the amount of bony new growth; more commonly it is found that a few minute sequestra at the end of the stump have been undetected for such a long time, and the irritation has then been greatly prolonged, so that there is a large, irregular exostosis out of all proportion to, and probably concealing, the cause of irritation.

Exostoses, as a rule, do not call for removal, but occasionally the radiographer is asked if he thinks they are doing any harm in a perfectly healed and otherwise excellent stump.

Causes for the removal of bony new growths fall under three heads: (1) Presence of a large "spur," which can be easily felt through the skin, and which is liable to be rubbed and irritated by an artificial limb; (2) the new bone outgrowing from the shaft sometimes presses against the nerve, in which case pain may be very severe and acute, and the removal of recently-formed bony tissue relieve the symptoms; (3) in a stump which is septic even after removal of a sequestrum, and which has a large amount of this bony new growth, the sepsis may persist for a longer time than usual owing to small pockets of pus in the crevices and irregularities of this soft semi-cartilaginous tissue.

One surgeon at this Hospital for three months removed all the stump exostoses that came under his notice, with the only result that the exostoses grew again, and in some cases pathogenic organisms, which were lying latent, were stirred to action by the operative interference.

Now in 71 amputation stumps of the thigh which were examined radiographically to determine the cause of their septic condition, the following facts were found.

All had a pathological condition of the bony stump, 49 had some form of sequestrum present, and 22 had exostoses alone in which no sequestrum could be detected. Of the 49 which contained necrosed bone, 43 also had exostoses present. This leaves, out of 71 cases, only six which had sequestra without any concurrent bony new growth.

The thigh was arbitrally divided into thirds, and the occurrence of sequestra and new bone noted in each. The following table is the result:—

	Sequestra.	Exostoses.	Sequestra and Exostoses.	Total.
Leg—				
Upper third	—	2	6	8
Middle third	2	4	4	10
Lower third	3	5	5	13
Thigh—				
Upper third	—	10	7	17
Middle third	2	3	14	19
Lower third	4	9	22	35
Total	11	33	58	102

From the figures given it will be seen that some form of exostoses was found in 90% of the amputation cases sent to the X-ray room. Practically all these cases are in a septic condition, and it would seem that the sepsis, *i.e.*, iritation, is the cause of the exostoses and not *vice versa*. In 66% of the cases, the septic irritation could be traced to sequestra present at the time the skiagram was taken. The irritation in the remaining 24% may have been due to:

(1) Small sequestral crumbs lying in the crevices of the old or new bone and not demonstrable by an X-ray picture. This is probably the most common.

(2) Small pieces of clothing and foreign matter, throwing no opacity to X-rays.

(3) Septic condition of surrounding parts, which has nothing to do with the condition of bone at the commencement, but subsequently sets up an osseous irritation.

The hardest figure to explain is the 10% of patients who have sequestra and no exostoses. One would imagine, in the light of one's experience, that this was well nigh impossible, but it may be explained in two ways:—

(1) The sequestrated piece is a piece of bone which has been forcibly detached from the shaft and lies in the soft tissue some distance from the stump, with the result that when this fragment of bone sequestrates, it is too far distant from the bone to be a source of irritation to the bony stump, and so no exostoses results.

(2) Just as in some individuals there is a tendency to be slow in the formation of callus after a fracture, so in a small percentage of these patients there may be the same idiosyncrasy, for, after all, these exostoses are only callus growth.

It will be noticed that a sequestrum did not occur without a companion exostosis in the upper third, that exostoses alone are common in the upper third, and that the further one proceeds toward the lower extremity of the bone, the greater is the total number of both sequestra and exostoses.

To explain these facts one naturally thinks of the blood supply in relation to the different parts. In the case of the femur, the following is the way the bone is nourished:—

(1) A small artery runs in the *ligamentum teres* to the head of the bone.

(2) The main nutrient artery comes from the second and third perforating artery, and enters the shaft of the bone just below its mid point.

(3) A small artery may come from the fourth perforating branch of the femoral artery, and enter the bone above the popliteal space, but this supply to the bone is not always present.

(4) Numerous small arterjoles run from the periosteum to the outer compact layer of bone.

From the above anatomical facts it appears that

the lower extremity of the bone is just as well, if not better, nourished than the upper portion, and some other reason must be found to explain the occurrence in the lower third of these abnormalities.

The causation of sequestra and exostoses is found in the time and place of the primary amputation, and of the re-amputation, and in the condition of the tissues at that time.

The percentage of amputations in the various portions of the thigh is, roughly, upper third 25%, middle third 50%, and lower third 25%. This is explained by the fact that in wounds above the knee joint the surgeon performing the primary amputation thinks it is best to go some distance above the joint, *i.e.*, into the middle third, in order to get healthy flaps and less chance of subsequent sepsis. The final result is that, although the number of mid-thigh amputations are equal to the total number in the other two thirds, on account of the less sepsis which has occurred, the total number of sequestra and exostoses is about half that found in the lower third. The same thing holds good for the upper third for the same reason.

Now on coming to the lower third a very different thing has occurred. Here the surgeon in France has tried to save as much of the leg as possible, and in wounds above the knee-joint has amputated just above the wound and trusted to a re-amputation to get good flap. As a result sepsis has been virulent, sequestra have formed, and healing has been delayed.

Now comes the point as to when a re-amputation is advisable, and here the conditions are very different to that of a primary amputation. The latter is of most benefit if performed soon after the wounding, before pyogenic organisms have multiplied in and infected, the surrounding parts, and an amputation some distance above the wound may save a lot of subsequent trouble. Now take the case for re-amputation, over which there is no hurry. The organisms have infected bone, muscle and other tissues; they are in the blood stream, and the whole of the combative forces of the blood are in action against these invaders. If the limb is now re-amputated fresh channels and new tissues are opened up for the organisms, and these tissues have not at the time got those bactericidal substances so richly developed as the tissues which have been cut away. The result is colonies of bacteria take a new lease of life, and healing is delayed. On the other hand, if the patient is kept until his body fluids have conquered all the organisms in his stump, except those few which may be kept alive by feeding on some piece of dead tissue (sequestrum), then the removal of the sequestrum or a re-amputation is an operation devoid of all danger, and the patient makes a quick and comfortable recovery.

In order to note the condition of healed stumps, 16 patients, who had been fitted with artificial limbs, were examined, and the following has been found.

Twelve had some form of exostoses, whilst four showed a clean, healthy bone, with no irreguarity whatever. This means that 25% of these healed stumps showed no exostoses, which is a very different figure to the 10% of septic stumps. The explanation is undoubtedly that the men with stumps healed when they arrive here, have had fewer operations, that re-amputations have been performed only when the primary amputation wound was clean, and thus reckless septic surgery has been avoided, and that sequestrum formation is far less common for the same reason.

One case worth special mention was that of a man who had a sequestrum of the femur 5 cm. long, and the dead bone had a complete casing of new bone. When a sequestrotomy was performed 1.25 cm. of new bone had to be chiselled through before the sequestrum was exposed, and so complete was this growth of new bone that as soon as the chisel cut through it, a quantity of pus was released and the sequestrum was found, as X-rays had shown it, lying free in this pus. The surrounding exostosis was left *in situ*, in the hope that it would form good bone and a longer stump result. The condition of the patient eight weeks after the operation showed that the sheath of new bone had remained healthy and was filling in the old cavity, and it looked as though, despite the removal of a piece of femur 5 cm. long, thanks to the new bone, the man's stump was going to be no shorter. This case points to the periosteum playing a most important rôle in the formation of new bony tissue.

What can be done to prevent the formation of sequestra in the stump?:—

(1) Secondary re-amputation should not be attempted until the stump is as aseptic as possible under the circumstances, even though it may mean waiting months. The distance of re-amputation from the end of the stump will not lessen the chance of the return of sepsis, as the organisms are free in the blood stream.
(2) The amount of periosteum stripped from the stump should be only that which is absolutely necessary.
(3) The primary amputation should be clear of the wound, although at the time it may mean sacrificing more bone, but this is more than justified if in this way the sepsis occurring is considerably lessened. Here the sepsis is confined to a small area around the wound and, as in the case of a re-amputation, the blood stream is not necessarily full of micro-organisms.

The presence of foreign bodies in patients to be fitted with artificial limbs must be mentioned. These bodies, after having been embedded in the tissues for some months since the man has been wounded, seem to cause little, if any, sepsis on their own account, but if the area around them does become septic, they act in exactly the same manner as a fully necrosed piece of bone.

On examining a patient with the assistance of X-rays, for other reasons, I have found as many as 52 fragments of a bone embedded in the soft and bony tissues of the foot without causing him any

apparent discomfort. Under these circumstances, operation for the removal of an aseptic foreign body seems unjustifiable, unless some other symptoms, due to the presence of a foreign body, are causing trouble.

Sometimes the patient is sent to the X-ray room without any further history beyond that he complains of recent acute pain in his stomach. It is helpful in these cases to remember that this painful sensation may be caused by the following conditions:—

(1) Abscess.
(2) Sequestrum.
(3) Foreign body.
(4) Inflamed and probably bulbous nerve.
(5) Exostosis causing secondary inflammation.
(6) Adherent scar.
(7) Periostitis following a fall, etc.
(8) Neurasthenia.

In these amputation cases a moderately soft X-ray tube is advisable for the following reasons:—

(1) It shows the difference in density between normal and diseased bone.
(2) It brings out more prominently the soft, only partly calcified exostoses which otherwise may be completely missed.
(3) The depth of bone beneath the skin is clearly shown, which is occasionally a guide to the surgeon in making his flaps.
(4) A sinus in its full length may show quite distinctly on the plate.

Reports of Cases.

BATH HEATER POISONING.

By **H. C. Rutherford Darling, M.D., M.S. (Lond.), F.R.C.S. (Eng.), F.R.F.P. (Glasg.),**
Sydney.

Cases of bath heater poisoning are not uncommon, and I therefore publish four cases that have come under my notice, in the hope that they may open up a discussion on this subject.

Dixon Mann states that the use of gas burners of the Bunsen type to heat large volumes of cold water, as is done in some bathrooms, is attended with considerable risk; the flame is rapidly cooled by contact with the surface of the water reservoir, and combustion is consequently rendered imperfect, the oxides of carbon, especially the monoxide, with acetylene being given off. When water is heated in this way, provision for abundant ventilation should be made.

He further points out that symptoms observed in poisoning by carbon monoxide are not always exactly the same, owing to the admixture of other gases; in fact, pure carbon monoxide poisoning can only be procured experimentally.

Clinical Cases.

Case I.—A.B., a man, *æt.* 19 years, following the occupation of waiter, was having a bath at 5 p.m. on October 15, 1917, when the other occupants of the boarding-house smelt "gas" fumes. On obtaining no response to knocking, they broke open the door. The patient was found unconscious on the floor. The window and door were both closed.

When I saw the patient he was still unconscious, the skin was cold and clammy, and of the colour of putty. The lips were cyanosed; the pulse was weak, and its rate 100. The pupils were dilated, the conjunctival reflex was lost and the muscles were relaxed. There was no odour from the mouth. There was a characteristic smell in the bath room. At 7.30 p.m. he had a rigor. The temperature was 37.2° C., and the pulse-rate 120. He made a smooth recovery, without the appearance of further symptoms.

He stated that he remembered having had a bath and having commenced to dry himself, when he felt giddy. He remembered nothing further.

Case II.—Mrs. C., a housewife, *æt.* 56 years, took a bath on June 17, 1918. According to the account given by her husband, she seemed to be in the bathroom for an abnormally long time. He therefore called to her, and as he obtained no response, the window was forced and the patient was found unconscious on the floor. She had completed her bath and had allowed the water to flow away. It appeared that she had almost finished drying herself. The bowels had acted.

On arrival at the house I found that she was dead. The lips were cyanotic and the conjunctivæ injected. There was no odour from the mouth.

The patient was known to have suffered from heart disease. Her usual medical attendant informs me that only a few months previously he had successfully piloted her through a severe attack of pneumonia without compensation breaking down. She had previously been in good health, and was in good health on the morning of June 17.

Case III.—The patient was D.E., *æt.* 58 years, a male. His wife gave the following history: On noticing a strong smell of gas while he was having a bath, she knocked at the bathroom door, but did not receive any response. The door was then opened, and she found her husband lying on the floor, unconscious. The window and the door had been shut.

I was sent for and found the patient unconscious. His skin was cold, clammy and putty coloured. The lips were blue. The conjunctivæ were hyperæmic, and the pupils dilated, fixed and insensible. The pulse was imperceptible at the wrist. The heart sounds were extremely weak and feeble. There was rigidity of the legs when the patient was first seen, but this passed off when the patient was removed to bed. He was almost totally clad; his pyjama trousers were on, his pyjama coat half on and his dressing-gown was rolled up under his head. He regained consciousness in about ten minutes. The total period of unconsciousness was about twenty minutes.

On the following day I saw him in the morning. He complained of headache and throbbing of his temples. The reflexes on the right side were slightly increased. There was a doubtful extensor response. He did not remember anything further than that he had taken a bath and had dried himself.

Case IV.—The fourth patient was a trained nurse, *æt.* 34 years. Her friend noticed a smell of gas from the bathroom while the patient was within. As she obtained no response, she opened the door and found the patient lying on the floor, unconscious. Both the window and the door had been closed. The patient had had a bath and was clad in pyjama trousers, but no coat.

On my arrival I noticed a characteristic smell in the passage approaching the bathroom. The patient had been removed to her bedroom. She was semi-conscious; her skin was pale, cold and clammy. The pupils were normal. The temperature was 34.4° C., and the pulse-rate was 120. The pulse was weak. The limbs were flaccid. She regained consciousness in about three minutes. The total period of unconsciousness was approximately fifteen minutes. She complained of giddiness and severe headache, and of extreme weakness.

On the following day she had recovered completely, except for a severe headache and a sprained ankle. She remembered having her bath, drying herself, putting on her pyjama trousers, and then feeling giddy. She remembered nothing further. She had had a previous attack fourteen days before, but on that occasion the bathroom door was slightly open. After having taken her bath, she felt giddy; she therefore opened the window and sat down for a few minutes. The giddiness then passed off.

These cases presented the signs and symptoms of carbon monoxide poisoning, as described in some text-books on toxicology. They are, however, very different from those usually met with. In the absence of laboratory tests, it is very difficult to dogmatize on the exact causative factor.

In the case of the fourth patient's attack, I think that there is no doubt that carbon monoxide was, in part at least, a causative factor, for, on the following day, after the bath-

room had been ventilated, a canary was placed in the room and the heater turned on. The canary died in fifteen minutes. Dr. Priestley was kind enough to examine its blood, and demonstrated carbon monoxide hæmoglobin. The variation of the symptoms, therefore, appears to depend either upon the dose of carbon monoxide or upon the presence of additional phenomena.

Comments.

(i.) The strong smell of "gas" referred to, is neither that of ordinary coal gas nor that of coal gas that has "backfired." It is very similar to the odour met with when a gas fire is first lit.

(ii.) The long latent period in all the cases is very striking. All the patients had had their baths, and three were nearly clothed when loss of consciousness supervened. This is characteristic of any cumulative gaseous poison, for when, as is usually the case, only a limited percentage of the gas is present, the symptoms do not develope until the individual had breathed the contaminated air for some considerable time. Haldane has pointed out that in the case of carbon monoxide poisoning it is necessary for the blood to be one-third saturated before characteristic symptoms develope. When the blood is half saturated the symptoms become urgent.

(iii.) The relative frequency of the condition is also of importance. Of the last 200 patients seen from my residence, four have suffered from "bath heater poisoning." One well-known pathologist informs me that his experience extends into two or three dozen cases.

Since coal gas is so largely used at the present time as a fuel for heating purposes, the general public should be educated concerning the dangers that may arise. It is surprising that in the twentieth century buildings should be erected in Sydney (*a*) heated by "gas fires" and provided with flues that do not permit of the removal of the products of combustion, and (*b*) containing "bath heaters" for the ventilation of which inadequate provision has been made.

In my opinion, the subject matter of this paper merits the strictest attention on the part of architects, plumbers and local municipal authorities relative to the erection of dwellings, so that the general principles enunciated by the authorities on public health and hygiene may be observed.

Reviews.

NERVE INJURIES.

The war has provided an almost inexhaustible field for investigation of nerve injuries, and Mme. Athanassio-Benisty has gathered together the conclusions drawn from the many cases examined and treated at the Salpetrière in a volume of the *Collection Horizon*.[1] The most interesting chapters will be found to be those in which the author discusses the painful forms of nerve lesions and the importance of associated arterial lesions in the clinical picture resulting from nerve injuries. The painful form of nerve lesion is found chiefly when the median or the internal popliteal nerve has been involved, and the condition closely resembles, from the clinical aspect, the causalgia which Weir Mitchel first described and which he attributed to an ascending neuritis. The position when the median nerve is involved is quite typical. The arm is held with the elbow flexed and the wrist slightly incurved; the hand is raised, never lowered, the fingers are extended with sometimes hyper-extension of the last phalanges and the thumb is in a position of adduction. The motor troubles may be but slightly present, but are never entirely absent. Most of the patients date their painful symptoms, not from the time of injury, but from a period eight to twenty days later. The pain is of a burning, sometimes of a tearing character, is constantly present, but is interrupted by paroxysms of more intense suffering, which may be precipitated by exposure to the dry air, by laughing, crying or any emotional disturbance. The sensibility when tested objectively is varying and capricious.

The author has studied the pathogenesis of the condition and, following Leriche, believes it to be due to an inflammation of the sympathetic fibres which accompany the mixed nerves of the limb.

Madame Athanassio-Benisty lays great stress on the importance of associated vascular lesions in the causation of the vasomotor, trophic and secretory disturbances which sometimes follow nerve lesions. When in a case of nerve injury we find a violet, red or bluish black discolouration of the tissues of the hand or foot, with a polished and stiff condition of the skin, with trophic affections of the nails, injury of a large arterial trunk must be suspected. This may be confirmed by examining the pulse of the affected limb, by comparing the blood pressures of the injured and uninjured limbs, or by obtaining a history of severe primary or secondary hæmorrhage. Operation will verify the fact, and it is an important point that surgical intervention, although resulting in the severance of more blood vessels, has never been followed by an aggravation of the symptoms, as if the operation had resulted in the freeing of some constricting band.

The book is illustrated by some excellent photographs of cases, but it is to be regretted that the anatomical diagrams are on much too minute a scale to be examined with comfort to the reader.

The author, in a separate volume of the same series, discusses the treatment of these cases.

[1] Formes Cliniques des Lésions des Nerfs, par Mme. Athanassio-Benisty, Préface par Pierre Marie, Deuxième édition. Collection Horizon: Précis de Médecine et de Chirurgie de Guerre; 1918. Paris: Masson et Cie; Crown 8vo., pp. 232. Price, 4 francs.

THE TREATMENT OF GONORRHŒA.

"The Systematic Treatment of Gonorrhœa," by N. P. L. Lumb,[1] is the title of a small handbook just arrived.

One wonders why the book was written, as there are absolutely no new methods of treatment introduced which have not been in the standard text-books for the last ten years.

[1] The Systematic Treatment of Gonorrhœa, by N. P. L. Lumb, M.R.C.S., Eng., L.R.C.P., Lond.; 1918. London: H. K. Lewis & Co., Ltd.; Crown 8vo., pp. 128. Price, 4s. 6d. net.

FEDERAL TAXATION RETURNS.

We have been requested to publish the following notice:—

Commonwealth of Australia—Federal Taxation Returns are Due by August 31, 1918.

Income Tax.—The following persons are liable to render income tax returns on account of income derived during the twelve months ended June 30, 1918:—

(*a*) Absentees and companies having a gross income of £1 or upwards.
(*b*) Partnerships and trustees whose gross income from all sources in Australia exceeded £156.
(*c*) Resident persons who are married and whose gross income (including board, quarters, etc., allowed by employer) from all sources in Australia exceeded £156.
(*d*) Resident persons who are not married and whose gross income (including board, quarters, etc., allowed by employer) from all sources in Australia was £100 or over.

"Not married" means bachelor, spinster, widow, widower or divorced person.

Penalty for neglect to duly lodge returns: Not exceeding £100.

Land Tax.—The persons required to make returns are:—

(1) All owners resident in Australia who at noon on June 30, 1918, owned land of an unimproved value of £3,000 and over.
(2) All absentee owners of land at noon on June 30, 1918, irrespective of the value of the land.

Penalty for neglect to duly lodge returns: Not exceeding £100.

All particulars may be obtained from posters displayed at all railway stations and post offices, and forms of return may be obtained from all post offices.

All persons in doubt as to their liability to render returns are invited to communicate with the Deputy Commissioner of Taxation, Elizabeth House, Elizabeth Street, Melbourne.

J. S. EASTWOOD,
Deputy Federal Commissioner of Taxation.

The Medical Journal of Australia.

SATURDAY, AUGUST 31, 1918.

The Naval Medical Service.

In last week's issue we announced that there were a few vacancies for temporary surgeons in the Royal Australian Navy. It does not appear to be generally known by the members of the medical profession that the medical service of the Royal Australian Navy has recently been completely re-organized. It was an open secret that the service stood in urgent need of reform. Complaints of defects made themselves heard in many quarters, and in many instances were well founded. The service became unattractive, and some difficulty was experienced in inducing men to apply for vacant positions. All this has been altered. The Director of Naval Medical Services has recommended the adoption of drastic changes, not only in administration and conditions of service, but also in the treatment of individual officers. In another portion of this issue we reproduce the regulations governing the admission into the Royal Australian Naval Medical Service and the particulars of this service. The medical profession should be familiar with the conditions, and its confidence in the service should be secured. As time goes on an increasing number of medical officers will be required for the Navy, and it is our duty to see that, as each keel is laid, preparation is made for the suitable manning of the completed ship. The Australian Navy is to share the traditions and reputation of the British Navy, and is destined to become part of it. The medical service must keep pace with the sister service in the Royal Navy, and a grave responsibility rests with that section of the medical profession which will provide its medical officers. Medical practitioners are reminded that there is important work for suitable men during the war in this service, and that it is a great privilege to belong to it. We appeal to the young graduates to apply for the permanent positions. We appeal also to medical practitioners of riper age to encourage their sons to enter the service, to maintain its prestige and the honour of Britain's invincible fleet.

MEDICAL REGISTRATION IN AUSTRALIA.

The Federal Committee of the British Medical Association in Australia has had on its agenda papers of several successive sessions a report of a special subcommittee dealing with the subject of uniform medical registration within the Commonwealth. Two guiding principles emerged from the discussion which took place on August 7, 1918, when this report was finally disposed of. The first principle is that, since the uncertainty surrounding any endeavour to induce the several State Governments to surrender their legislative rights in this connexion to the Federal Government, renders it impracticable for the present to demand Federal legislation, it is essential that Acts now in existence should be brought up to one standard level and thus rendered uniform. The second principle is that the standard of efficiency should be raised. In regard to the first point, there appears to be a consensus of opinion in all the Branches that the State Governments would not yield their rights, even if pressure were brought to bear on them. But even if this primary difficulty were overcome, the members would require a definite guarantee that the legislation which the Federal Government would substitute for the existing State enactments, would be as satisfactory as the best of these Acts. No one can give this guarantee, and therefore it is obviously a wiser course to aim at a uniform standard in the six Acts and to postpone the change of control to some future date. The argument in favour of a Federal act need not be discussed, in view of the fact that the time is not ripe for the change.

While the urgency of obtaining uniformity of legislation throughout the Commonwealth is manifest, it is equally apparent that there must be a levelling up and not a reduction to a lower grade. It is not contended that the efficiency of an individual medical practitioner is governed by the examinations he has passed. It may be even argued that examinations are indifferent tests of knowledge. No one, however, has yet devised a better alternative, and consequently a profession can only be judged by the rigour of the course of study prescribed for its students and by the searching nature of the test applied at the end of the course. Medical science demands that the course shall extend over a series of at least five years. There is difference of opinion whether the preliminary, not es-

sentially medical, subjects should be taught within the medical course or independently of it. There is much in favour of the proposal that every medical student should take an arts course before entering the medical school. The standard of general education would be raised and the student would be better prepared to devote his whole energies to the essential medical subjects, namely, physiology and physiological chemistry, anatomy and embryology, clinical medicine and surgery, materia medica, pharmacology and toxicology, operative surgery, pathology, including ætiology, bacteriology, morbid anatomy, histology and experimental work, psychiatry and neurology, gynæcology and obstetrics, ophthalmology and the science of diseases of the ear, throat and nose and hygiene. The discussion of the advisability and practicability of introducing uniformity into the course of study of these sciences at our three medical schools will occupy our attention on another occasion. For the purposes of a satisfactory standard of efficiency to justify the registration of an applicant as a medical practitioner, there should be an examination which only a well-trained student, after five years' study, could pass. Translated into practical language, the qualifications should be first and foremost the degree issued by our Australian Universities, and, second, the qualifications entitling the individuals holding them to be registered in Great Britain and Ireland. If registration were limited to these two classes of persons the public would be amply safeguarded against the dangers of an inefficient practitioner practising with the sanction of the law.

The next point to be determined is whether a person trained in a British possession or a foreign country should be enabled to secure registration in Australia. In regard to the former, steps are being taken to arrange that the degrees issued by the universities in British possessions, where a five years' course is essential, shall be registerable in Great Britain. Consequently, there does not appear to be any need for special provision to meet with the difficulty of a graduate of a Canadian or South African University seeking to practise in Australia. Theoretically, there is only one sound way to deal with persons seeking registration in virtue of foreign degrees or diplomas. This is to make the recognition dependent on a reciprocal arrangement between the two countries concerned. In practice, however, it can be argued that reciprocity is a dead letter as far as Australia is concerned, for the international arrangements would have to be carried out between the foreign country and the Imperial Government, and it is inconceivable that the Imperial Government would arrange for this reciprocity between the Commonwealth and a foreign country and neglect to secure the same for Great Britain. Notwithstanding the fact that a reciprocity clause in a medical act would be unlikely to secure for any foreign graduate the right of registration in Australia, its inclusion, if adequately worded, is advisable, since it is the one rational basis for the admission of such a person. The expedient of a State examination for the same purpose should be handled with extreme care. The examination could be made so difficult as to be practically prohibitive. This, however, would be in the hands of the University, and would not be provided for by the statute. To make it easy would be to risk an undesirable lowering of the standard of efficiency. The Federal Committee recognized the danger of this alternative, and preferred to run no risks.

One word should be directed to the constitution and powers of the medical boards. Under a Federal act it would be possible to set up a body similar to the General Medical Council. Until the time arrives for the transference of the control of the medical profession to such a body, the six medical boards should be modelled on similar lines, and should be composed of medical practitioners of the highest standing, at least one-half of whom should be the nominees of the medical profession itself. The boards should have the power to judge the *bona fides* of applicants for registration, to remove names from the registers for felonies, misdemeanours and "infamous conduct in a professional respect," and should be responsible for the integrity and honour of the profession as a whole.

Any amendment of the existing Medical Acts which fails to provide these safeguards, both in regard to the registration in the State concerned and also in regard to the constitution and powers of the Medical Board, must be opposed on the ground that it would introduce a menace to the public welfare.

DEFECTIVE WATER HEATERS.

The publication of four cases of alarming illness of persons exposed to some influence associated with the heating of water by gas in a bathroom calls for serious investigation. Dr. H. C. Rutherford Darling deserves our thanks for directing attention to this subject. The circumstances attending the onset of illness rendered it difficult for him to carry out a full investigation of all the factors, and consequently it is impossible at present to determine whether or not the cases were all of the same nature, and what that nature was. This could only have been decided after a full examination of the water heaters, a careful analysis of the atmosphere in the bathrooms after the gas had been burning for some time, and an exhaustive study of the toxicological aspect of the signs and symptoms. There is no evidence of the nature of the defects in the heaters. We are informed that the pattern of the heaters was not uniform. In each case an odour, possibly that of methane or acetylene, was detected in the room. In the majority of water heaters of this type, a non-luminous flame, like that of a Bunsen burner, is used. The temperature at the hottest part of one of these flames may be something approaching 1,200° C., while the temperature in a luminous flame is below 400° C. at the point at which an object held in it becomes covered with soot. If the hot flame is employed and the water is heated by contact, it is obvious that the upper part of the flame must contain gas which is cooled down very considerably. The stream of gas is thus incompletely combusted in the case of water heaters constructed on the plan of a Bunsen burner and a reservoir for the water with metal walls separating the flame from the water. A properly constructed flue suffices to carry off the products of incomplete combustion. If these products were allowed to escape into the room, there would be grave danger of coal gas poisoning, which usually means carbon monoxide poisoning. It has yet to be determined whether other gaseous bodies can be developed in sufficient quantity under the obtaining circumstances to create a danger to life.

Dr. Darling has no direct evidence that the patients were suffering from carbon monoxide poisoning. The experiment with the canary is certainly suggestive, and proves that in the one room the heater allowed of the escape of uncombusted coal gas. The four cases were similar in several respects. The persons became giddy after having taken a bath, and soon afterwards lost consciousness. When found they were cold, their skin was pale, slightly cyanotic and moist. The picture of carbon monoxide poisoning differs in many respects from this. It will be remembered that Gréhant proved that the blood of a person exposed to an atmosphere containing one part of carbon monoxide per thousand parts of air contained 5.5 volume per cent. of carbon monoxide, while when the dilution was one part in two thousand the volume percentage was 2.8. Vogel was able to determine that 2.5 parts per thousand was the lowest concentration capable of producing dangerous symptoms in man. Moreover, it has been proved by many investigators that it is the concentration of the gas in air, and not the length of exposure, that determines the appearance and severity of the signs. Haldane was able to show that an atmosphere containing 0.04 volume per cent. of carbon monoxide and 20.95 volume per cent. of oxygen saturated the hæmoglobin to the extent of 38.9%. This is probably the lowest degree of saturation capable of inducing unconsciousness. In such a case the skin is markedly pink and the arteries are dilated. In other words, when the concentration of carbon monoxide in the air is sufficient to produce severe symptoms of poisoning, including unconsciousness, the hæmoglobin must be one-third saturated with carbon monoxide and the characteristic appearance of the face and skin generally will lead the practitioner to seek a source of carbon monoxide.

In the series of cases there was one death, and three patients made a rapid and ostensibly complete recovery. The person who died was the subject of a cardiac lesion, and in the absence of a *post mortem* examination it would be hazardous to incriminate the carbon monoxide. From the time of the celebrated experiment of Humphrey Davy on himself, it has been recognized that severe poisoning may occur and pass off without signs of late involvement of the central nervous system. On the other hand, accumulated experience has taught that the risk of degenerative changes in the minute vessels of the central nervous system is great, and that these changes appear in the majority of patients. It is therefore suggestive that three patients recovered rapidly and completely. Mott's classical case indicates the possible extent of these changes.

It would thus appear that, in the absence of more complete information, we are justified in doubting whether these cases are really instances of carbon monoxide poisoning. In all probability the atmosphere contained carbon monoxide. In one case it must have contained at least one part in a thousand, for a canary died of carbon monoxide poisoning. What the deleterious agent was in these cases must still remain uncertain. The health authorities should follow up each accident of this kind and endeavour to trace the cause of the illness.

THE GRADING OF RECRUITS.

One of the reasons why the Director-General Medical Services journeyed to Europe was to enquire into the causes of the return of so many members of the Australian Imperial Force before they had been to the firing line. These men had been passed as fit in Australia, and on re-examination in England were rejected. In view of this, it is interesting to learn from a debate in the House of Commons on June 20, 1918, and from letters which have appeared in the English newspapers, that the Ministry of National Service have been attacked on the system of the grading of recruits, and have justified the method in vogue, despite the admission of some faults. It will be remembered that, under the old system, the medical boards were asked to pass recruits as fit for active service, or fit for special service, or to recommend their rejection on the ground of physical unfitness. This plan broke down, because in the majority of instances the medical practitioners undertaking the examination did not fully appreciate the requirements

of the service and the nature of the duties which a combatant was to undertake. Under the new scheme the men are divided into three classes, "A," "B," and "C," according to the nature of the work to be done. Sir Auckland Geddes pointed out in the debate that as long as civilian practitioners performed this examination it was essential that the military authority should be able to assess the military value of the recruit from the report. Three groups were introduced into each class. The practitioner was asked to decide as accurately as possible whether the recruit was reasonably fit for his age. In other words, a man was passed Grade I. if his physical condition corresponded to that of a normal, healthy man of his age. If his physical condition corresponded to that of a man older than his years, he would be graded II. or III. The military authority could then determine the value of the individual recruit as a fighting unit. Absence of obvious disease and reasonable physical fitness were the two things the medical examiner had to consider. It would thus seem that the examiner's task is more direct, and, from one point of view, easier, than if he were asked to report generally on the condition of a recruit. During the period of great stress a large number of medical practitioners agreed to devote from two and a half hours to five hours a day to this work, and to examine four men in each hour. Sir Auckland Geddes expressed his gratitude to the medical men doing this work "under the enormous difficulties and pressure at the present time on very inadequate remuneration." They receive 4s. 2d. per recruit examined. They received instructions to devote as little time as possible to men who could not pass at all or who could not be graded above III., for these men were not being used for combatant service. These men could be disposed of in a couple of minutes, and consequently more time would be gained for those who ultimately passed in Grades I. and II.. The Ministry has been forced to put the brake on some of the London Boards during the German offensive of March, April and May, because there was a tendency to rush the recruits through. From the military point of view this was undesirable, and consequently the Minister caused these boards to "slow down."

It might be asked why the medical examination in Australia is not systematized in a similar manner and the recruits graded on a workable plan, such as the one in force in Great Britain.

Naval and Military.

CASUALTIES.

It is our painful duty to record the death of two officers of the Australian Army Medical Corps: Captain John Sidney Wilson, who received his commission on October 1, 1916, died in France on August 9, 1918, of wounds. Major John Clarence Wells, Regimental Medical Officer, First Light Horse, whose appointment to the Australian Imperial Force dates back to the beginning of 1915, died of wounds in France on August 10, 1918. Short accounts of the careers of our two gallant colleagues will be published in an early issue of the *Journal*.

In the 424th list of casualties, issued on August 21, 1918, it is recorded that Captain Isaac Manly Barrow has been wounded. In the 425th list, issued on August 27, 1918, there is an entry to the effect that Captain Louis Michael Pigott has been wounded.

Public Health.

NEW SOUTH WALES.

The following notifications have been received by the Department of Public Health, New South Wales, during the week ending August 10, 1918:—

	Metropolitan Combined District. Cs.	Dths.	Hunter River Combined District. Cs.	Dths.	Rest of State. Cs.	Dths.	Total. Cs.	Dths.
Enteric Fever	10	2	1	0	1	0	12	2
Scarlatina	21	1	1	0	14	0	36	1
Diphtheria	49	2	3	0	71	1	123	3
*Pul. Tuberculosis	22	12	1	0	16	0	39	12
C'bro-Sp'l Menin.	2	1	0	1	1	0	3	2
Poliomyelitis	0	0	0	0	1	0	1	0

* Notifiable only in the Metropolitan and Hunter River Districts, and, since October 2, 1916, in the Blue Mountain Shire and Katoomba Municipality.

VICTORIA.

The following notifications have been received by the Board of Public Health, Victoria, during the week ending August 11, 1918:—

	Metropolitan. Cs.	Dths.	Rest of State. Cs.	Dths.	Total Cs.	Dths.
Enteric Fever	0	0	1	0	1	0
Scarlatina	39	1	27	0	66	1
Diphtheria	102	3	62	1	164	4
Pulmonary Tuberculosis	22	14	5	4	27	18
Poliomyelitis	1	—	0	—	1	—

QUEENSLAND.

The following notifications have been received by the Department of Public Health, Queensland, during the week ending August 10, 1918:—

Diseases.	No. of Cases.
Enteric Fever	6
Scarlatina	9
Diphtheria	62
Pulmonary Tuberculosis	9
Cerebro-Spinal Meningitis	1
Malaria	5
Puerperal Fever	1

SOUTH AUSTRALIA.

The following notifications have been received by the Central Board of Health, Adelaide, during the week ending August 3, 1918:—

	Adelaide. Cs.	Dths.	Rest of State. Cs.	Dths.	Total. Cs.	Dths.
Enteric Fever	0	0	1	0	1	0
Scarlatina	0	0	10	0	10	0
Diphtheria	4	3	35	1	39	4
Pulmonary Tuberculosis	0	3	5	3	5	6
Erysipelas	1	0	0	0	1	0
Pertussis	4	0	5	0	9	0

WESTERN AUSTRALIA.

The following notifications have been received by the

Department of Public Health, Western Australia, during the fortnight ending August 3, 1918:—

	Metropolitan. Cases.	Rest of State. Cases.	Totals. Cases.
Enteric Fever	3	0	3
Scarlatina	24	8	32
Diphtheria	21	35	56
Pulmonary Tuberculosis	8	0	8
Cerebro-Spinal Meningitis	1	0	1
Malaria	1	0	1
Erysipelas	3	1	4

TASMANIA.

The following notifications have been received by the Department of Public Health, Tasmania, during the week ending August 10, 1918:—

Diseases.	Hobart. Cases.	Launceston. Cases.	Country. Cases.	Whole State. Cases.
Enteric Fever	0	0	1	1
Diphtheria	0	2	3	5
Pulmonary Tuberculosis	1	0	0	1

THE PUBLIC HEALTH ADMINISTRATION OF NEW SOUTH WALES.

(Continued from page 171.)

State Hospitals.

David Berry Hospital.

The Secretary of the David Berry Hospital publishes a report of the work done during the year. On the first day of January, 1916, there were 14 patients in the Hospital and during the course of the year 192 were admitted. The number of patients discharged was 187 and the number of deaths was 13. The Secretary calculates the mortality as a percentage of the total number of patients under treatment. It need scarcely be pointed out that this is inadmissible, since, in a certain number of cases, the treatment is incomplete. Calculated on the Registrar-General's formula, the mortality works out at 6.63%. The average number of patients in the Hospital at any given time was 9.25.

Fifteen of the patients were admitted on account of diphtheria or scarlet fever, or both. Three of the patients were suffering from enteric fever and seven from influenza. The other pathological conditions under treatment do not call for special comment.

The Medical Superintendent performed a large number of operations. In the majority of these he obtained assistance from medical practitioners in Nowra. There were six deaths following operations, which numbered 118, including minor operations. The total expenditure amounted to £1,947. This covers the fees paid to the Nowra practitioners for the administration of anæsthetics, as well as all ordinary maintenance charges. Calculated on the basis of the average number of beds occupied, it works out at £210 9s. 9d. per patient per annum. The number of patients who contributed towards their maintenance was 68, and the amount paid as fees, together with the proceeds of sales, aggregated £228. The Medical Officer calls attention to the fact that an X-ray apparatus is urgently needed.

Lady Edeline Hospital for Babies.

The Matron of the Lady Edeline Hospital for Babies issues a report dealing with the third year of this institution. The Director-General states that very good work has been done during the year in saving babies. An epidemic of gastro-enteritis of a severe type was dealt with. It appears that no less than 193 children were admitted for this condition. There were 28 in the Hospital still under treatment at the end of the year. The case mortality was 21.1%. The total number of infants admitted during the year was 271. The total number of deaths was 46 and of patients discharged was 197. The total mortality was therefore 17.9%. The Matron gives the figures of 16.97%, but apparently includes the children remaining in the hospital at the end of the year in her total number. In addition to gastro-enteritis, marasmus, pathological dentition and pneumonia contributed a considerable number of cases. The case mortality of marasmus was 25% and of pneumonia 33.3%. Only three cases of pertussis were treated. One of the patients died. From these figures it will be seen that the death-rate from pneumonia and pertussis was very high, and that very few cases of pertussis and bronchitis were dealt with. The Matron makes the statement to the effect that these diseases were very prevalent, but that the death-rate was low. Reference is made in this report to the work conducted at the Baby Clinics, eleven of which have been established in the congested areas of the metropolis. Apparently the nurses at the Baby Clinics arrange for the admission of infants from the Clinics to the Hospital. The average number of cots in daily occupation was 20, and the average number of beds for mothers in daily occupation was six.

The Strickland Convalescent Home for Women.

The second annual report of the Acting Matron of the Strickland Convalescent Home for Women can be commended for its brevity. The number of patients admitted during the year was 501. There were 30 patients in the Home on the first day of the year, and 507 patients were discharged during the year. The Home apparently fulfils its functions in an admirable manner.

Convalescent Hospital for Men.

The Acting-Matron of the Convalescent Hospital for Men also issues a second annual report, giving the essential details in a few words. Starting the year with 18 patients, the Hospital received 209 others during the twelve months, and on the last day gave shelter to nine. In the majority of cases the patients passed their convalescence after acute illness, and derived much benefit from their stay.

Rookwood State Hospital and Asylum.

The Rookwood State Hospital and Asylum is stated to be the largest institution of its kind in the Commonwealth. It has accommodation for 1,421 inmates. During the course of the year 3,458 persons were admitted, which, together with the 1,321 patients remaining in the institution, totalled 4,479. Of these, 2,970 were discharged and 533 died. The remaining 1,276 were still being cared for on the last day of the year.

The Hospital division contained 642 patients on January 1, 1916. To this division 2,661 persons were admitted during the year. The number of persons discharged from the Hospital was 2,128 and the number of those who died 533. The average cost per head (patients and inmates) was £32 4s. 9d. It appears that the Hospital division contains 13 wards, which are under the care of the resident medical staff. An attempt has been made to classify the diseases under treatment. Two wards are set aside for patients suffering from epilepsy and mental disturbance. Those persons who are certified as insane are transferred to the hospitals for the insane. Although 137 beds are set aside for these epileptic patients, extra accommodation is urgently needed. The wards for the reception of persons suffering from pulmonary tuberculosis are also overcrowded.

During the course of the year no less than 214 major and 160 minor operations were performed. The Honourable J. B. Nash resumed his duties as Honorary Surgeon. Fifty persons suffering from cancer or venereal diseases were admitted from the Liverpool State Hospital. In the Dermatological Department Dr. Charles Ayres dealt with 351 patients suffering from various skin affections, while a large amount of work was carried out by Dr. W. A. Dunn in the Ear, Nose and Throat Department and by Dr. Guy Antill Pockley in the Ophthalmological Department. The laboratory diagnostic tests were carried out at the Microbiological Laboratory of the Department, while the essential X-ray work was performed at the Sydney Hospital.

The changes in the *personnel* of the staff were considerable. Dr. W. A. McDonald left the institution to take up his position as Medical Superintendent at the State Hospital and Asylum, Liverpool. Dr. F. Short was appointed in his place, and, on his transference to the staff of the Coast Hospital, Dr. R. M. McKay took up the duties. He has also acted as Medical Superintendent during the absence of Dr. Fox. He calls attention to the necessity of increasing the resident staff by the appointment of a third medical officer. It is obviously impossible for two resident medical officers to deal efficiently with 650 patients.

(To be continued.)

Abstracts from Current Medical Literature.

ORTHOPÆDIC SURGERY.

(68) The Transplantation of Bone.

W. E. Gallie and D. E. Robertson (*Journ. Amer. Med. Assoc.*, April 20, 1918) record the results of experiments of bone transplantation extending over four years. The immediate change in the transplant in specimens recovered a few days after operation is coagulation of all cells and vessels out of reach of the surrounding percolating lymph. There is death of all cells in the lacunæ and most of those in the Haversian canals. On the surface of the graft and in the open mouths of the Haversian canals are cells in contact with lymph; these proliferate and begin to form new bone at the end of about ten days. In addition, these attack dead bone, produce excavations which become filled with proliferating cells and later with new bone. This change on the surface is accompanied by an extraordinarily rapid ingrowth of new blood vessels. This ingrowth may be complete in small porous grafts in fourteen days. Osteoblasts spread along the vessels with excavation and new bone formation in the depths of the graft. The rapidity of the changes depends on three factors: the size of the graft, its density and the number of osteoblasts which survive on the surface. In very thick grafts the replacement of new bone may take many months. Replacement is slow in dense bone, as that of the crest of the tibia, rapid in open cancellous bone, as in a rib. The third factor is of the greatest importance. If periosteal and endosteal surfaces are preserved, there is a good supply of osteoblasts and the changes are rapid. If these surfaces are removed, as in pegs and dowels, the graft has very little osteogenetic power. These facts were obtained from grafts which were transplanted into muscle. When placed in contact with living bone, the changes were more rapid, and this suggested the use of dead bone as a transplant. The conditions of the experiments were varied by boiling the graft for 20 minutes. In muscle there was little change, even after many months, but in contact with living bone changes very similar to those in the living graft were observed. These changes were slower than in the living, but the same factors determining rapidity of change operated with the same result. From these experiments principles are deduced. The value of bone grafting is established, but where a gap has to be bridged, as in long bones, autogenous grafts with living osteoblasts along the whole extent are necessary because it is only at the ends that there can be bone formation from contact with living bone. The central portion must depend on living transplanted osteoblasts. Boiled bone would become absorbed, and heterogenous bone behaves similarly. In the treatment of non-union of fractures the autogenous graft is also necessary, as bone-forming activities are at a minimum. In cutting grafts the maximum osteoblast-bearing area should be obtained. Thus, in the tibia, the anterior surface, and not the crest, should be used, and the whole thickness should be taken. If strength is not required, a rib is preferable. It should be split into several longitudinal pieces and slotted to expose the endosteal surfaces to the percolating lymph. Regarding the periosteum the results of the experiments agreed with Macewen's conclusions that the periosteum is only a limiting membrane. Bone was transplanted with and without periosteum into muscle and the osteogenesis was the same in both. Where fixation is the object of operative treatment, boiled bone offers advantages in the fact that plates and screws of bone fuse with the living bone and at the end of six months disappear completely. The authors have tested their experimental results clinically on a series of 60 cases of Pott's disease, 60 cases of non-union and malunion in fractures, and 60 open operations in recent fractures, in which boiled plates and screws were employed. In the spinal grafts previously prepared boiled bone was used with satisfactory results. In non-union Albee's inlay graft was used, and, in addition, the surrounding bone was treated with drilling and saw-cutting, to provoke a marked reaction. They add a warning from their experience in a military orthopædic clinic against the performance of grafting until six months have elapsed since the original injury, and in some cases of attempting to bridge the gap at all. They think it is better to accept a certain amount of shortening. Operations on the jaw and face are described with technical details of the application of their methods.

(69) Arthroplasty with the Aid of Animal Membrane.

William S. Baer (*Amer. Journ. Orthopædic Surg.*, January, February and March, 1918) discusses the question of the production of movement in ankylosed joints. He reviews the methods under the headings *brisement forcé*, arthrolysis, pseudo-arthrosis, resection, transplantation of the entire joint and arthroplasty. In his own arthroplastic operations, he uses chromicized pig's bladder as the separating medium, and describes the changes that had occurred on re-opening four joints in which it had been used. The membrane had been absorbed, but a cavity persisted, with a perfectly smooth lining. Microscopically it was seen that the chromicized bladder had been invaded by round cell infiltration from the side of the denuded bone. The cells towards the joint side were flattened, but there was no distinct endothelial lining to the joint. It was evident that the membrane had been transformed into fibrous tissue and a joint-like space with fibrous walls formed. The advantages of using animal membrane over muscle, fascia, fat and non-absorbable inorganic plates are stated to be a minimum amount of resection of the bone surfaces, simplicity of the operation, the maintainance of the stability of the joint and lessening of the chances of infection, rendering the after-treatment less painful and yielding as a result a practically normal joint. The chromicized membrane should be thin and flexible, but tenacious enough to resist disintegration for at least sixty days and aseptic. The author describes operations on the tempero-mandibular, hip and knee joints, in which the method of using the membrane is given. His series of operations comprises nine on the tempero-mandibular, fifty on the hip, twenty-eight on the knee, three on the phalangeal, one on the ankle, three on the elbow, two on the radio-ulnar and three on the shoulder joints, together with one on a tendon sheath. After omitting cases of hip and knee operations in which the movement was less than 25°, he states that he obtained successes in 68%. After operation the joints should be placed in plaster and immobilized for four weeks. After removal of the plaster passive, followed by active, movements should be used, with physical and mechanical measures to increase the range of movement.

(70) Compensatory Shortening of the Unaffected Femur in Asymmetry.

Jacques Calvé and Marcel Galland (*Amer. Journ. Orthopaedic Surg.*, April, 1918) describe three methods of shortening the femur: (1) Auto-pegging, in which both fragments are cut obliquely, but the lower has a tenon (the length of the desired shortening), which fits into the medullary cavity of the upper fragment. (2) Tenon and mortise. In this the bones are cut as in the first method, but the upper fragment is mortised and the tenon is anchored by a suture of suitable material. (3) Dovetailing. The authors recommend the first and second methods. The third gives a better mechanical result, but is too difficult. The indications for the operation are fracture of the femur with great shortening, coxalgia with anatomical shortening and old congenital dislocations. The operation should not be undertaken unless the amount of shortening exceeds five centimetres.

In their experience seven centimetres may be removed from the unaffected femur with good results in the function. They describe a special guide to get both oblique surfaces in the same plane, and in the operation they use electrically driven saws. The after-treatment consists in fixing the entire lower limb, pelvis, base of the thorax and shoulder of the same side in plaster. The shoulder is released on the eighth day, movement of the knee allowed on the twentieth day, but the rest is not removed for two months.

(71) Fracture of the Tibia Following Removal of Bone Graft.

Fracture of the tibia from very slight injury has occurred in three cases recorded by John A. Brooke (*Amer. Journ. Orthopædic Surg.*, June, 1918). In each the graft was cut with a motor saw and the tibia was not split with a chisel. The patients were allowed to walk at the beginning of the fifth week. The fractures in each case were oblique, and extended from one angle of the space

from which the graft had been removed. He suggests that there should be some support for the tibia for a greater period than five weeks.

MORPHOLOGY.

(72) The Growth of the Cerebral Cortex.

In No. 7 of a series of comparative studies on the growth of the cerebral cortex Naoki Sugita, of the Wistar Institute of Anatomy and Biology, discusses the influence of starvation at an early age upon the development of the cerebral cortex of albino rats (*Journ. of Comparative Neurology*, June 15, 1918). Three methods were adopted for producing underfed young: (1) separation of the young from the nursing mother for a maximum period each day; (2) entrusting one mother with the care of an excessive number of young, and thus reducing the amount of milk available for each of them; (3) underfeeding the nursing mother, and thus reducing the quantity of milk secreted. The young were killed for examination at ages ranging from three to forty days, as were the controls, the body measurements and brain weights being recorded, and then the brain was fixed, sectioned and stained for microscopical examination. By method (1) the underfed rats were found to be 29% less in body weight and 8% less in brain weight than the standards for the same ages. In methods (2) and (3) they were 39% less in body weight and 8% less in brain weight. Thus starvation without removal from the nest and corresponding disturbance to the young, retards the growth of the brain relatively less, despite the greater arrest in body growth. The underfed brain weight was found on the average 24% higher than the standard for the same body weight. The shape of the cerebrum is slightly elongated as compared with the standard of the same brain weight, and approximates that for the same age. The growth of the central nuclei seems to be arrested more in width than in length. The general average thickness of the cortex in the underfed is greater by about 7% than the standard for the brain of the same weight, the areas particularly noticeable being those which normally show the higher rate of increase in thickness during post-natal growth. The relative volume of cerebral cortex is some 16% less in the earlier stages of development than in the standard for the same age, but after 16 days of age it tends to be compensated for or over-compensated by as much as 6% greater than the standard. As the cortex contains the same number of cells, there is thus a relatively higher cell density in a unit volume up to the age of 16 days, but the nerve cells themselves are smaller in average diameter by about 9%. From a consideration of the percentage of water and of the alcohol-extractives it is concluded that the process of myelinization in the brain is somewhat retarded for the age. Thus the smaller weight and size of the underfed brain is due to an arrest in the growth and development of the constituent neurons and not to a decrease in their number.

(73) Studies of Amitosis.

In the *Journal of Morphology* (March 20, 1918) Waro Nakahara presents the results of an investigation on the relation of the amitotic nuclear division and metabolic activity in the adipose cells of insects, together with an historical review and discussions on the general subject of amitosis. The larvæ of *Pieris rapæ* (common cabbage worms) were used for the complete working out of the subject, although many other insect larvæ, especially lepidopterons, were used in preliminary work and for comparison. The adipose cells from the first stage larvæ are very small, and each contains a single spherical nucleus. The cell-body is rich in cytoplasm, and a few fat droplets; a very small quantity of glycogen can be demonstrated, with very rarely some mitotic figures. In second stage larvæ the cells are almost twice as large as in the first stage. The nuclei frequently show changes indicative of stages of amitosis, and a few cells are binucleate. From this stage onwards not a single mitotic figure has been observed. The cytoplasmic area is much enlarged, and contains abundant fat droplets and glycogen in large quantities. Late in the third stage albuminous granules begin to appear. In full-grown larvæ the adipose cells seem full of albuminous granules, and many cells contain two or more nuclei. The available evidence indicates that these albuminous granules are endogenic in origin, and there is no doubt that the nuclei take a rôle of essential importance in the formation of this reserve material. The occurrence of bi- or multi-nucleate cells in larval adipose tissue has been known for many years, and their origin has given rise to much discussion. It may now be stated as being due to the division of the nucleus, without any corresponding change in the cell body rather than the fusion of two or more cells. If adipose tissue containing such cells be examined, no mitotic figures are to be seen, although many nuclei show changes which may be interpreted as various stages in the process of amitosis. This change in *Pieris* begins at an early stage long before the albuminous granules appear, *i.e.*, while the cells are still functionally very young. Such daughter nuclei of amitosis are not independent nuclei, but are really only parts of a single nucleus as a reproductive unit, for if mitosis follows, the chromatin substances of the daughter nuclei form a single equatorial plate of chromosone, and division then takes place in the normal way. In conclusion, it is stated that amitosis may occur for the purpose of securing an increase of the nuclear surface to meet physiological necessity due to active metabolic interchanges between the nucleus and cytoplasm. Apparently it is not a method of cell-multiplication nor a sign of degeneration or senescence of cells, but, whenever it occurs, it seems to indicate an intense activity in the vegetative functions of the cell.

(74) Studies on Cytolysins.

M. F. Guyer and E. A. Smith are engaged in an extensive series of experiments concerning cytolysins, and in the *Journal of Experimental Zoology* (May 20, 1918) present a progress report concerning some prenatal effects of lens antibodies. The animals experimented upon were rabbits and mice, similar results being obtained with each. Fowls were used as the source of antibodies, and the lenses of the eyes of animals experimented upon were employed as antigens. The fowls were gradually sensitized by repeated intraperitoneal injections of lens emulsified in normal saline solution. When the fowl was considered ready, it was decapitated under aseptic conditions and the blood collected. Pregnant rabbits or mice, according to which animal was being used, were injected with the sensitized fowl serum. No effect was noticed on their lenses, but in the case of the progeny many cases were found of liquefaction of the lenses or of clouding and opacities in the lenses. These changes would indicate a true cytolytic effect of the several proteins composing the lens, and it is upon this that the sensitized serum seems to have operated. It thus seems legitimate to infer that lens tissue, when injected into fowls, excites the production of specific antibodies, which may attach *in utero* the lenses of the young of the species used as antigen, even though the reaction is not invariable.

(75) Remedies and Preventives Against Mosquitos.

In the *Review of Applied Entomology* (April, 1918) the subject of the remedies for and preventives against mosquitos is dealt with by L. O. Howard. It is stated that protection from the bites of mosquitos may be obtained by the use of various protective liquids, of which a few drops may be rubbed on the face and hands or sprinkled on the pillow at night. Most of those in common use volatalize readily, so that their effect does not last right through the night, and to enhance their value certain mixtures are recommended, of which the most efficacious are (*a*) oil of citronella 1 part, spirits of camphor 1 part and oil of cedar 0.5 part; (*b*) castor oil, alcohol and oil of lavender in equal proportions. Of the various smudges and fumigants, pyrethrum powders are very effective when fresh and pure, and are most economically used by moistening and moulding them into small cones, which, when dry, burn readily if lighted at the apex. Equal parts by weight of carbolic acid crystals and gum camphor form a good fumigant. The acid crystals are melted over a gentle heat and poured slowly over the gum, forming a clear, rather volatile liquid, of which 1 c.cm. volatilized over a lamp will very effectively treat every 1,000,000 c.cm. of room space. The screening of houses, using netting for beds, the wearing of veils and gloves after nightfall are obvious necessities in badly infested regions. The abolition of breeding places by drainage measures, or by oiling the water surface with common kerosene, is a necessity.

THE ROYAL AUSTRALIAN NAVAL MEDICAL SERVICE.

The following are the regulations for admission into and particulars of service in the Royal Australian Naval Medical Service, as revised up to July 1, 1918:—

Regulations for Admission and Particulars of Service.

Qualifications.

1. Every candidate for admission into the Medical Branch of the Royal Australian Navy must not be under twenty-one years nor over twenty-eight years of age when accepted for service.

2. Every candidate must furnish an application on the prescribed form, and must attach to his application—

A certified extract from the Register of his birth, or, if this cannot be obtained, a certificate of his baptism or other documentary evidence, accompanied by a statutory declaration made by his parents or guardians before a justice of the peace, stating the exact date of birth.

3. Candidates must be the sons of natural-born British subjects. (In doubtful cases the burden of clear proof will rest upon the candidate himself, his parents, or guardians.) Before entering as Surgeon in the Royal Australian Navy every candidate must declare—

(*a*) His age and place of birth.
(*b*) That he is of pure European descent and the son of natural-born British subjects.
(*c*) That he labours under no mental or constitutional disease or weakness, or any other imperfection or disability which may interfere with the most efficient discharge of the duties of a Medical Officer in any climate.
(*d*) That he is ready to engage for general service at home or abroad as required.
(*e*) Whether he holds or has held any positions or appointments in the public services.
(*f*) That he is a duly registered practitioner under the States' Medical Acts, or that he holds qualifications which entitle him to become a legally registered medical practitioner under the States' Medical Acts, giving the date of his registration as a medical student, or of his beginning his professional studies.
(*g*) What medical and surgical diplomas he has obtained, and the appointments held since obtaining his qualifications.

4. The Dean of the Faculty of Medicine of the Australian University where the candidate was a student, or other professional gentleman, may be requested to render to the Naval Board a confidential report as to the candidate's character, conduct, professional ability, and fitness to hold a commission in the Royal Australian Navy. Candidates from other schools will be dealt with on their merits, but no candidate will be accepted unless he can produce most satisfactory testimonials.

5. Candidates will, when possible, be interviewed by the Director of Naval Medical Services, and will be required to present themselves for medical examination as to physical fitness for service in the Royal Australian Navy.

6. The Naval Board may direct applicants after passing the physical test to present themselves for competitive examination held by an examining board appointed by the Naval Board from nominations by the Universities of Sydney, Melbourne and Adelaide. No candidate will be permitted to sit more than twice for this examination.

7. The candidate, on entry, will be given the rank of Surgeon, and will be on probation for the first year after commencing naval duties. After the probationary service his appointment will be confirmed in this rank if recommended by the Director of Naval Medical Services, the seniority to date from the date of probationary appointment.

8. A candidate, however, who at the time of entry into the Medical Branch holds, or is about to hold, an appointment as a medical or surgical officer at a recognized civil hospital may be permitted to serve in such civil appointment, provided the period of service does not exceed one year after the date of entry, provided always that the request for this concession is made at the time of application for an appointment to the Royal Australian Navy as a permanent Surgeon. This concession is not retrospective. Pay from naval funds will be withheld from gentlemen so serving, but the time concerned will count for seniority and for purpose of increase of active pay and deferred pay, if approved by the Naval Board. The names of these candidates will be placed in a separate list in the Official Navy List from the date of entry, but they will not assume the title of Surgeon R.A.N. until they commence naval duties. They will then be transferred to the Surgeons' List in their original order and enter on the year of probation.

9. As a general rule Surgeons on commencing naval duties will be appointed to one of H.M.A. Depôts or ships carrying a Senior Medical Officer, in order that they may become acquainted with service conditions before being sent in charge of a ship.

10. Medical Officers on the permanent list will be appointed to shore establishments or harbour ships and sea-going ships in rotation, so far as the exigencies of the service permit.

11. Surgeons are required to provide themselves with the regulation pocket case of instruments and stethoscope, other necessary instruments, drugs and utensils being supplied by the service.

12. A small medical library (not exceeding £12) is supplied to ships and establishments where a Medical Officer is borne.

13. *Relative Rank.*

Navy		Army.
Medical Branch.	Military Branch.	
Surgeon	Lieutenant	Captain
Staff-Surgeon	Lieutenant-Commander	Major
Fleet-Surgeon	Commander	Lieutenant-Colonel (but junior to this rank)
Director of Naval Medical Services	Captain	Colonel

Pay and Allowances for Medical Officers in the Royal Australian Navy.

14. The following rates of active pay, deferred pay and allowances shall apply to Medical Officers appointed to the Royal Australian Navy:—

Time Served in Rank.	Active Pay						Deferred Pay						Total per annum.		
	Per diem.			Per annum.			Per diem.			Per annum.					
Surgeon—	s.	d.		£	s.	d.	s.	d.		£	s.	d.	£	s.	d.
On entry ..	20	0		365	0	0	5	0		91	5	0	456	5	0
Two years..	21	0		383	5	0	5	0		91	5	0	474	10	0
Four years.	22	0		401	10	0	5	9		104	18	9	506	8	9
Six years ..	23	0		419	15	0	5	9		104	18	9	524	13	9
Staff-Surgeon	25	0		456	5	0	6	6		118	12	6	574	17	6
Two years..	27	0		492	15	0	6	6		118	12	6	611	7	6
Four years.	29	0		529	5	0	7	0		127	15	0	657	0	0
Six years ..	30	0		547	10	0	7	0		127	15	0	675	5	0
Fleet-Surgeon	33	0		602	5	0	8	0		146	0	0	748	5	0
Two years..	35	0		638	15	0	8	0		146	0	0	784	15	0
Four years.	37	0		675	5	0	9	6		173	7	6	848	12	6
Six years ..	38	0		693	10	0	9	6		173	7	6	866	17	6
Eight years	40	0		730	0	0	10	0		182	10	0	912	10	0
Ten years ..	42	0		766	10	0	10	0		182	10	0	949	0	0

Director of Naval Medical Services.

15. The appointment of the Director of Naval Medical Services will usually be made from Fleet Surgeons of at least six years' seniority. This is a special appointment, the salary attaching to which will be fixed by the Governor-General in Council.

Additional Emoluments.

16. (*a*) Medical attendance in kind, subject to such regulations as may be approved by the Naval Board.

(*b*) Uniform allowance, at 1s. per day—£18 5s. per annum. On first joining, a uniform gratuity of £40 (Temporary Surgeon £25) will be paid to officers, but in this case the uniform allowance of 1s. per day will not commence until one year after appointment. In the event of discharge within twelve months, except by invaliding, a proportionate part of gratuity shall be refunded.

(*c*) Rations will be supplied subject to such regulations as may be prescribed by the Naval Board.

(*d*) Lodging allowance will be paid to officers where not provided with accommodation or quarters on shore—

	Per diem.			Per annum.		
	s.	d.		£	s.	d.
To Surgeons	4	0	..	73	0	0
To Staff-Surgeons	5	3	..	95	16	3
To Fleet-Surgeons	5	6	..	100	7	6

(*e*) Married Allowance.—On production to the commanding officer of satisfactory evidence of marriage, an allowance shall be payable in accordance with the scale set out hereunder:—

Number of Children under 16 years of age.	Surgeon or Staff-Surgeon. Per diem. s.	d.
None	2	0
One	2	3
Two	2	6
Three	2	9
Four and over	3	0

In order to obtain married allowance, the officer must make an allotment to his wife of not less than one-third of his active pay (excluding allowances), plus the full amount of married allowance payable. Married and lodging allowances are not payable concurrently when an officer resides at his own home.

(*f*) Charge Pay.—Naval Hospitals and Hospital Ships—
Staff-Surgeons and Fleet-Surgeons under four years' service—2s. 6d. per diem, £45 12s. 6d. per annum.
Fleet-Surgeons over four years' service—5s. per diem, £91 5s. per annum.

(*g*) Charge Pay.—To Senior Medical Officer on board ships:

	Per diem. s.	d.	Per annum. £	s.	d.
With complement of 350 to 649	1	0	18	5	0
With complement of 650 to 799	2	0	36	10	0
With complement of 800 and over	3	0	54	15	0

To obtain these allowances Medical Officers must have over four years' seniority. In regard to depôts and sea-going parent ships, the combined complements of parent ships and tenders will be reckoned.

(*h*) Flag Allowance.—To the Senior Medical Officer of the Flagship—5s. per diem, £91 5s. per annum.

(*i*) Administrative Allowance.—To the Director of Naval Medical Services (if a Fleet-Surgeon under six years' seniority not on consolidated pay) and to the Assistant to the Director of Naval Medical Services (if on sea-going pay)—3s. per diem, £54 15s. per annum.

(*j*) Allowance in hospitals in lieu of servants—
To Surgeons and Staff-Surgeons—£20 per annum.
To Fleet-Surgeons—£40 per annum.

Fees.

17. Private practice is not allowed, but where Surgeons under special circumstances approved by the Naval Board attend on patients not provided for in the Regulations they may accept fees. It should be clearly understood, however, that such attendance must in no way interfere with or take them from the vicinity of their service duties, which are to be considered first in every case.

Retirement.

18. Compulsory retirement will take place as follows:—
Fleet-Surgeons at 55.
Staff-Surgeons at 45, unless promoted to higher rank prior to date due for retirement.
Surgeons shall be retired—
(*a*) On attaining eight years' seniority, if they have previously failed on two occasions to pass the Staff-Surgeons' examination, or
(*b*) On second failure to pass the examination, if Surgeons sit for the examination after attaining eight years' seniority, or
(*c*) On attaining ten years' seniority, if they fail to sit for the examination a second time.
Medical Officers will be retired at any time when found to be physically unfit for general service.

19. Voluntary retirement may take place at any time subject to the approval of the Naval Board and Section 13 of *Naval Defence Act, 1910-12*, as follows:—
(1) Except in time of war, an officer may, by writing under his hand, resign his commission at the expiration of any time not being less than three (3) months from the date of receipt of the resignation.
(2) The resignation shall not have effect until it has been accepted by the Governor-General.
(3) For special reasons the Governor-General may accept any resignation at any time after the receipt thereof.

20. Officers are liable to be dismissed from the service or to be compulsorily retired at any time for misconduct, in which case they forfeit all claim to deferred pay; officers may also be dismissed for inefficiency.

Deferred Pay.

21. (*a*) Deferred pay shall be payable to an officer on retirement or resignation. Payment may, in special cases, subject to the approval of the Naval Board, be made to officers on completion of seven years' service since entry or since last payment of deferred pay.
(*b*) In case of the death of an individual whilst in the service, the full amount of accumulated deferred pay will be payable to his estate.
(*c*) Persons dismissed from the Navy for misconduct, as defined by the *Naval Discipline Act*, will forfeit all claim to deferred pay.

22. Rates of deferred pay are as follows, assuming the Medical Officer entered on July 1, 1918:—

	Per diem. s.	d.	Per annum. £	s.	d.
Surgeons, on entry	5	0	91	5	0
Surgeons, after four years	5	9	104	18	9
Staff-Surgeons	6	6	118	12	0
Staff-Surgeons, after four years	7	0	127	15	0
Fleet-Surgeons	8	0	155	2	6
Fleet-Surgeons, after four years	9	6	173	7	6
Fleet-Surgeons, after six years	10	0	182	10	0

Thus Medical Officers may draw, subject to the approval of the Naval Board—

	Total Amount. £	s.	d.
At the end of the seventh year	679	16	3
At the end of the fourteenth year	834	16	9
At the end of the twenty-first year	1,049	7	6
At the end of the twenty-eighth year	1,250	2	6

23. Compensation in the case of Medical Officers on account of wounds or injuries received or diseases contracted on duty is provided for in the Financial and Allowance Regulations, as follows:—

"Compensation may be recommended by a Board consisting of three Medical Officers appointed to inquire into the case of any member of the Permanent Forces who is retired or discharged on account of wounds or injuries received, or disease contracted due to service, provided the wound, injury or disease was not due to the member's fault. The Medical Officers selected shall be the most senior available. When three Medical Officers are not available, two Senior Medical Officers may form the Board. The compensation shall be according to the following scale:
(*a*) The maximum amount.
(*b*) Three-quarters of the maximum amount.
(*c*) One-half of the maximum amount.
(*d*) One-quarter of the maximum amount.
(*e*) One-eighth of the maximum amount.
(*f*) One-sixteenth of the maximum amount.

The maximum amount shall be a sum equivalent to three years' pay, including any allowance in cash or kind for quarters, clothing and rations at the rate received, allowed or valued at in these Regulations at the date of his retirement or discharge. The maximum amount shall only be awarded in case of total disability to earn a livelihood. In case of partial disability, the compensation shall be less than the maximum amount, and shall be fixed in accordance with the scale, so that the amount awarded shall be proportionate to the degree of disability of the member, as may be determined by the Naval Board.

Compensation may be recommended by a similar Board for the case of the widow and family of any member of the Permanent Forces who is killed when on duty, or dies of any disease contracted due to service, if the death or disease was not due to the member's default. The amount of compensation awarded shall not exceed three years' pay, including allowances for quarters or rations, at the rate the member received or was allowed at the date of his death. No claim for compensation shall be considered unless it is made within twelve months after the death of the member."

War Pensions.

24. In war time compensation in accordance with Paragraph 23 will be superseded, and pensions granted in lieu, subject to provision being made by Parliament. Under the

provision of the *Commonwealth War Pensions Act, 1914-16*, war pensions in accordance with the scale laid down by the Act (up to £3 per week), may be granted to dependants or members upon the death or incapacity of members of the Defence Force of the Commonwealth, whose death or incapacity results from their employment in connexion with warlike operations or preparations.

25. Medical Officers and their dependants, who thereby become eligible to receive Commonwealth war pensions, lose their right to payment by way of compensation in accordance with the Financial and Allowance Regulations stated above, but this does not affect payment of deferred pay.

Furlough.

26. Paragraphs 35 to 39 of the Financial and Allowance Regulations, 1918, provide as follows:—

"(35) Where any person, including members of the Permanent Sea-going Forces, has continued in the service of the Commonwealth under the provisions of the *Defence* or *Naval Defence Acts* at least twenty years, the Governor-General may grant to him, on the recommendation of the Naval Board, leave of absence for a period not exceeding twelve months on half pay, or six months on full pay, in addition to annual leave granted during such service.

"(36) Where a person has become transferred or appointed from any position of a permanent nature under the State or Commonwealth to a permanent position in the service of the Commonwealth under the provisions of the *Defence Act* or *Naval Defence Act*, all continuous service of such person under the State or Commonwealth shall, for the purpose of furlough, as provided in Regulations 35 and 38, be reckoned as service in the service of the Commonwealth under the provisions of the *Defence Act* or *Naval Defence Act*.

"(37) Where a person not having been granted such leave of absence provided in Regulations 35 and 38 retires from the service after at least twenty years' service, the Governor-General, on the recommendation of the Naval Board, may authorize the grant to such person of six months' salary upon retirement, or, upon the death of any person who has continued in the service for at least twenty years, and has not been granted leave of absence under the provisions of Regulation 35, the Governor-General, on the recommendation of the Naval Board, may authorize the grant to the dependants of such deceased person of a sum equivalent to six months' salary of such person. Provided that where any such person has been reduced in position or salary through misconduct, such misconduct shall be taken into consideration in determining whether the whole or any portion of the prescribed leave of absence may be granted, or, in the event of retirement or death of any such person, whether payment may be made under the conditions prescribed herein, and as to the terms of such payment.

"(38) The Governor-General may, on the recommendation of the Naval Board, grant to any person of satisfactory service who is not eligible for the furlough prescribed in Regulation 35, leave of absence with full pay, as follows:—

Service of sixteen years and under twenty years—Five months.
Service of twelve years and under sixteen years—Four months.
Service of eight years and under twelve years—Three months.
Service of four years and under eight years—Two months.
Service of less than four years—one month.

Always provided that such person has attained the prescribed age for retirement or will attain the prescribed age for retirement on or before the expiration of such leave of absence.

In lieu of such leave the Governor-General may, on the recommendation of the Naval Board, authorize the grant of a sum equivalent to his salary for such period of leave, or, in the event of the death of any person who was eligible for, but had not been granted, the leave prescribed herein, may authorize payment to the dependants of such deceased person of a sum equivalent to the salary of such person for the period of leave which he could have been granted under this Regulation.

"(39) In the case of persons on sea-going rates of pay, salary shall mean the total emoluments at date of granting furlough, including deferred pay and allowances for uniform, rations, and quarters, whether drawn in cash or in kind."

Promotion.

27. (*a*) The rank of Staff-Surgeon will be granted to Surgeons at the expiration of eight years from the date of entry, subject to the approval of the Naval Board and the following conditions:—

For the rank of Staff-Surgeon an officer must—
(1) have served three years at sea;
(2) have passed the qualifying examination;
(3) be recommended for advancement by the Director of Naval Medical Services.

(*b*) Special promotion will be made, at the discretion of the Naval Board, to the rank of Staff-Surgeon in cases of distinguished service or conspicuous professional merit. Such promotions will be exceptional, and will not exceed one in three years. This limitation will not, however, apply to promotions for gallantry in action.

(*c*) Accelerated Promotions.—Certificates will be granted to Surgeons at the qualifying examination for Staff-Surgeon according to the following scale of marks:—

50% of marks for a pass.
75% of marks for a first-class certificate.
85% of marks for a special certificate.

28. An officer obtaining a first-class certificate will be eligible for an advance of twelve months' seniority, and one obtaining a special certificate eighteen months. This accelerated promotion will not be granted on the examination results alone. An officer must be recommended as deserving advancement. The Naval Board reserves the right to reduce this advancement if considered advisable by the Director of Naval Medical Services. If a Surgeon fail to pass at the first attempt, the result of a successful second trial will not count towards accelerated promotion.

29. Staff-Surgeons will be promoted to Fleet-Surgeons on attaining eight years' seniority as such, subject to the approval of the Naval Board and the following conditions:—

(*a*) A Staff-Surgeon must—
(1) have served three years at sea in that rank;
(2) be recommended for promotion by the Director of Naval Medical Services;
(3) never have declined service except for reasons which were acceptable to the Naval Board.

(*b*) Special promotion from the rank of Staff-Surgeon to Fleet-Surgeon will be made, at the discretion of the Naval Board, in cases of distinguished service or conspicuous professional merit. Such promotions will be exceptional, and will not exceed the rate of one in four years. This limitation will not apply, however, to promotions for gallantry in action.

Examination for Staff-Surgeons.

30. The examination will be held once a year or more often as requisite, and will consist of written papers on medicine, surgery (clinical and operative), pathology, bacteriology, hygiene, and naval hygiene; questions on diseases of the eye, ear, nose, throat, also on anæsthetics and tropical diseases, may be included in the papers.

31. The papers will be set by an examining board appointed by the Naval Board from nominations by the Universities of Sydney, Melbourne and Adelaide. Candidates for the examination may sit during the fifth or subsequent years of service. The examination will be held at such time as will meet the requirements of the candidates.

32. A Surgeon who fails to obtain a pass will be allowed a second trial, but will not have a second course of instruction. If he fail at the second attempt he will be compulsorily retired on reaching eight years' seniority or on the second failure if over eight years. He will then receive the full amount of deferred pay due to him. Should a Surgeon not pass until over eight years' seniority, his seniority as Staff-Surgeon will be dated back to date from the date of attaining eight years' seniority as Surgeon, but he will only be eligible for increase of active pay and deferred pay from the date of passing the examination.

33. Should a Surgeon reach ten years' seniority without having sat twice for the Staff-Surgeons' examination, he will be required to resign his commission, except in exceptional circumstances and with the approval of the Naval Board.

Note.—Special arrangements will be made for Surgeons and Acting Staff-Surgeons serving on the date of issue of these regulations.

Hospital Study.

34. Three courses will be available:—
(*a*) For Surgeons prior to the Staff-Surgeons' Examination.
(*b*) For Senior Medical Officers over fourteen years' seniority.
(*c*) A course for any Medical Officer required to take up some special work.

35. Under (*a*) Surgeons after completing four and a half years will, subject to the exigencies of the service, as soon as possible take a six months' course of study at an approved Medical School, after which they must sit for the next Staff-Surgeons' Examination.

36. Surgeons attending a course must submit a programme of their proposed studies to the Director of Naval Medical Services, and must produce certificates of attendance. The course must include clinical medicine and surgery, operative surgery, pathology, diseases of the eye, ear, nose, throat and hygiene. Optional subjects: bacteriology, skiagraphy, electro- and serum-therapy. The cost will, up to a limit to be decided by the Naval Board, be borne by the service.

37. Under (*b*) Medical Officers who have completed fourteen years will be permitted a three months' course as occasion arises to refresh their general knowledge. Officers must submit a programme of their proposed studies to the Director of Naval Medical Services. The cost will be borne as for (*a*).

38. Full pay, lodging, victualling and clothing allowances under Regulations will be granted during the above courses.

Leave of Absence.

39. Leave of absence will be granted in accordance with the Regulations for the Permanent Sea-going Forces.

Surgeons for Temporary Service.

40. Surgeons who are appointed temporarily to the R.A.N. Medical Service in time of war or emergency to meet the requirements of the Navy will be appointed under the following regulations.

41. Qualifications:—
(1) To be of pure European descent and the son of natural-born British subjects.
(2) To be a duly registered practitioner under the States' Medical Acts, or to hold qualifications which entitle the applicant to become a legally registered medical practitioner under the States' Medical Acts.
(3) To be reported fit after medical examination.
(4) Age not to exceed forty years.

42. Pay and Allowances:—
Pay at the rate of 25s. per diem.
Rations (or allowance in lieu) will be supplied subject to such regulations as may be prescribed by the Naval Board.
Uniform allowance on taking up first appointment to be £25. A proportionate amount is repayable in the event of discharge, except by invaliding, within twelve months from date of appointment.
To receive same allowances as are payable to permanent officers of their rank, provided that uniform allowance will not be paid until the expiration of twelve months' service.
Medical Officers, on discharge, will be granted twenty-eight days' leave on full pay for each completed year's service, or seven days for each completed three months' service, provided the officer is not discharged for misconduct or incompetency.
To receive compensation for injuries, etc., or war pension in accordance with Paragraphs 23 and 24 above.

43. Conditions of Service:—
To engage for six months certain, but liability of service to be limited to the end of the war and six months after.
To be liable to immediate discharge for misconduct or incompetency.
To be given two calendar months' notice (not including the period of leave due) of his services being no longer required.
To rank with, but after, Surgeons in the permanent service.
To be under the general rule of the service as regards discipline, etc.
Voluntary resignation to be allowed subject to the exigencies of the service, but leave due at the termination of service will be forfeited thereby.
Medical Officers will be retired at any time when found to be physically unfit for general service.
To serve when and where required.
Lodging money and allowances to be granted at the same rate as for permanent Surgeons when accommodation is not provided.
Surgeons are required to provide themselves with a stethoscope and a pocket case of instruments; other necessary instruments are provided by the service.

44. Messing:—
Surgeons will be allowed, when attached to ships in commission, the ordinary ship's rations, but will have to pay about 2s. per day towards the maintenance of their mess, and the usual ward-room officers' mess subscriptions.

45. Officers so desirous may, subject to approval of the Naval Board, transfer to the Permanent List of Medical Officers, provided they are recommended and vacancies exist. The time already served as a temporary Surgeon will in such cases count towards pay, deferred pay, seniority, promotion and retirement. An additional uniform gratuity of £15 will be paid, to bring uniform allowance to £40. Payment of uniform allowance of 1s. per day will be payable only after twelve months' service (permanent and/or temporary). They must be able to conform with the regulations for permanent Surgeons at the time they joined as temporary Surgeons.

46. Uniform:—
The uniform worn by temporary Surgeons shall be the same as for permanent Surgeons, except that, instead of the stripes of ½-inch gold lace round the sleeves of coats, there are to be waved lines of ¼-inch gold lace.

47. Civil surgeons are invited to register their names with the Director of Naval Medical Services as desirous of temporary service in the R.A.N. in time of war or emergency, for convenience in communicating with them, giving their qualifications, appointments, etc., it being clearly understood that they are under no obligation to serve until they formally apply for service.

48. The Director of Naval Medical Services will communicate with them once a year, asking if they are still available for service.

49. Any change of address should be notified to the Director of Naval Medical Services, Navy Office, Melbourne.

Emergency List of Medical Officers.

50. Medical Officers, on resigning their commissions in the permanent or temporary service, may, if they so desire, and are recommended by the Director of Naval Medical Services, be placed on the Emergency List of Medical Officers. Officers so enrolled are allowed to retain their commissions and wear the uniform of their rank. Only officers who continue to practise their profession will be allowed to enroll on this list.

51. Medical Officers whose names are placed on this list will not receive active pay, deferred pay, allowances of any kind, or promotion when not employed. Medical Officers of the Royal Navy who may settle in Australia, and on whom the Royal Navy does not possess prior claim, may enroll on this list.

War Service.

52. Medical Officers on the Emergency List shall be liable to be called up for service in time of war or national emergency.

Pay and Allowances.

53. When on war service they will receive, as from the date when first borne for duty, pay and allowances as follows:—
(*a*) Active pay, deferred pay, ration allowance, uniform allowance, and other allowances as for corresponding ranks in the permanent service, provided that uniform allowance shall not be payable until the expiration of twelve months' active service on the Emergency List.
(*b*) Notwithstanding anything contained in clause (*a*) above, the pay of Fleet-Surgeons on this list will on no account exceed £2 per diem active pay and 10s. per diem deferred pay.

Equipment Allowance.

54. When first called out for service in war or emergency, officers will be granted an equipment allowance of £25. No

officer shall draw this allowance more than once whilst on the Emergency List.

Deferred Pay.

55. At the end of the period of war service, Medical Officers will receive in cash the amount of deferred pay earned during the period of war service, as provided in regulations for the permanent forces.

War Leave.

56. Twenty-eight (28) days' leave on full pay for each completed year's service, or seven days for each completed three months' service, will be granted, provided Medical Officers are not discharged for misconduct or incompetency.

Compensation for Injuries, etc.

57. Medical Officers will also become entitled to compensation for injuries received, or disease contracted on duty, or war pensions, if provision is made by Parliament, in accordance with the terms and conditions prescribed for the permanent service.

Resignation.

58. Except during time of war, voluntary resignation will be permitted, but officers so withdrawing will be required to resign their commissions, and will not be permitted to wear their uniform. Resignation during the period of war will be subject to the exigencies of the service.

59. On attaining the age of fifty-five, officers will be compulsorily retired.

60. Officers will be communicated with annually up to the age of retirement. They will be requested to state whether they are fit for service.

61. Emergency Medical Officers may transfer to the Royal Australian Naval Brigade, when they will be allowed to count seniority on the Emergency List towards seniority in the R.A.N.B. In the R.A.N.B., they will be eligible for appointment as D.N.M.O., and will be subject to those Regulations as regards pay, etc. They will wear the uniform of officers in the Brigade, but permission may be granted to wear the uniform of the emergency officers.

THE "JACKASS."

We all have a tender regard for the kookaburra, and recognize the dear old sociable thing in the *Jackass*, the first number of which has just appeared. Possibly it might be as well for us to explain that the *Jackass* in this instance is not a bird, but is the official organ of the First Australian General Hospital. Like its namesake, it is homely and chatty, and makes us laugh. The staff of the magazine comprises Colonel J. A. Dick, President; Major J. S. Verco, Vice-President; Private J. R. W. Taylor, Literary Editor; Private C. Leyshon White, Art Editor (his sketches are quite delightful); Staff-Sergant J. H. Jacobs, Treasurer; and Private A. C. Wilkinson, Business Manager. In connexion with the last position, it may be noted that the only advertisement which this excellent little magazine carries is itself. It is a very excellent advertisement. We are apt to groan under the load of a weekly journal produced in the peaceful city of Sydney, with all the modern conveniences of linotype machines and fine screens for block-making. Our admiration for the editorial staff of the new magazine is unbounded when we think of the conditions under which it is produced. The letterpress is light and witty. It speaks of an indomitable spirit in the men contributing, and makes the reader long to be there. The following extracts, culled from its pages, are reproduced for the benefit of those who have not yet seen a copy:—

> Definitions.—Orderlies: The word orderly is derived from the word "order," to be bossed. An orderly has a pretty good job, being about 14 hours a day on duty, besides stretcher-bearing at night. In his spare time he attends lectures, kit-inspections, fire parades, etc., etc. The rest of the day he has to himself.
>
> The Post Office is a place where one is supposed to get letters and civility, but seldom gets either.
>
> Clerks are the people who wear collars and ties, polished boots and a worried look when busy. They seldom look worried.
>
> Answers to Correspondents.—"Serieux" sends poem entitled "The Time is Ripe." The rhyme is tripe.

Correspondence.

SOLDIERS' EYESIGHT.

Sir,—In your issue of March 16, 1918, you published an article by me on the above subject. I have received a great number of letters from senior medical officers who are or who have been on active service abroad, approving of it. The last I have just received is from a prominent ophthalmic surgeon who has been on active service abroad since the early days of the war. He writes:—

> I read an article of yours in the *Australian Medical Gazette*[1] on the vision of recruits, with which I entirely agree. It is not possible for me to take part in any public discussion, but the last Army Council Instruction with reference to the vision of recruits is certainly a great improvement on anything they have ever issued before. I, however, venture to think they might go still further. It is Army Council Instruction, No. 421, of 1918, dated April 21. The point that strikes ophthalmic men here is that if you admit that men who can see with glasses can fight, then it does not matter what they see without glasses. They carry three pairs, and, if they lose them they are no worse off than a man with a sprained ankle. You may be able to do something in the way of modifying Australian opinion.

I am seeing almost daily men who have been rejected because of their eyesight, but whose vision is quite good enough for any branch of military service, and others whose sight would be good enough for certain branches. This is not only my opinion, but, as I have had expressed to me, the opinion of senior medical men who have been on active service for years.

It is a pity that so much good material should be turned down unnecessarily when we are so short of recruits. I understand that some modification of the sight test has been under contemplation for months, but it is characteristic of the procrastination and dilatoriness of the Department that nothing has yet been done.

Yours, etc.,
F. ANTILL POCKLEY, M.D.

227 Macquarie Street, Sydney,
August 23, 1918.

NURSES AND RADIOGRAPHY.

Sir,—Dr. McKay, when writing on the above subject, instanced the case of a sister in the Lewisham Hospital whose radiographic work gave him entire satisfaction. Is it not true that the circumstance of this lady's life precludes her from extending her sphere of work in this direction beyond the institution in which she lives, and, if so, was not this aspect of the case suppressed by the writer of the letter in order to support his views? It is, I think, at all times to be regretted that points should be made unfairly by an advocate of any principle the unqualified merits or defects of which are being discussed and scrutinized, and which may have far-reaching results if hastily adopted and applied. Such a course obscures both merits and defects, and the main purpose of the discussion you desired is defeated.

It surely must be apparent to every one—except, perhaps, your correspondent—that he, or she, who is elected by a responsible staff of experts to impart knowledge must possess such knowledge in the first instance, and if this knowledge, in the case of radiology, is but superficial and inefficient it is unwise to impart it, since it is likely to prove dangerous to those who might acquire it and make use of it for diagnostic or surgical guidance.

The principle which underlies all modern radiology is exactness, and to disregard this is, according to the verdict of all surgeons and physicians of repute, to court disaster. And so I contend that the expert nurse must be efficient both as a radiographer and interpreter, otherwise she must not be elected as an instructress and guide.

It is not always such modest reference heralds a new discovery of great worth as is found in the last sentence of Dr. McKay's letter contributed to your journal of the 17th inst. Therein he speaks of an X-ray which possesses a very new quality—that of being capable of fathoming the

[1] This article appeared in *The Medical Journal of Australia*, and is the one referred to by Dr. Pockley.

reputation of the X-ray specialist—he refers to it, therefore I assume he must know something of it, and I shall forthwith proceed to furnish him with a most convenient opportunity to apply it, and at closer range than the implication in his letter suggests likely.

Some years ago a medical practitioner of this city consulted one of the leading surgeons in Sydney. After examination he was referred to an unqualified person for radiograms. He remonstrated, remarking that the members of his profession who were established radiographers were being ignored. He was curtly informed that all patients of this surgeon who demanded radiographic pictures were referred to this individual. Some two years later a friend of mine, who consulted a Sydney surgeon whose professional reputation is exceptionally high, was also referred to this unregistered practitioner, and my friend told me that during his sojourn in the private hospital many were there who had similar experience. These statements I can verify; and be it understood that medical radiographers were in existence in Sydney then as now. Here, then, is the opportunity for the reputation-fathoming ray—and at mighty close quarters.

Hall Edwards recently, and many radiologists of world-wide repute, have from time to time in the medical journals urged the necessity of conserving radiology and its allied branches for members of the medical profession, not merely for their benefit, but for the protection of the public, and this view has been emphatically endorsed by members of the profession who have attained distinction in departments other than radiology.

But your correspondent, in his ostensible solicitude for the country practitioner—who, it has been shown, can acquire the knowledge he demands at the proper source and from those who are properly equipped to teach him—not only holds a different view, but attempts to attribute the sentiments of those men—for I but re-express them—to the unworthy motive of fear lest their reputation suffer, and this I should imagine is quite as secure as is his own. Those men may be wrong, and there are some who may think them so, but, even so, I think that "'tis better to err with Pope than shine with Pye."

Yours, etc.,

A. A. DOYLE.

George Street, Brisbane,
August 22, 1918.

Obituary.

THOMAS WILSON CORBIN.

On the 10th day of August, 1834, Thomas Wilson Corbin first saw the light of day at Friargate, in Derbyshire. His father was a minister of the Congregational Church. In 1837 his mother died, and in 1853 his father was called to London, to occupy the position of pastor at the Tabernacle. Thomas Wilson Corbin received his schooling at Islington, and remained at an educational academy until he had attained the age of 25, when he became apprenticed to a Dr. E. W. Tait, a general practitioner in Canonbury. In 1861 he became a student at St. Bartholomew's Hospital. He acted in the wards as clinical clerk to Dr. Greenhalgh and as dresser to Sir James Paget. At the end of his three years he passed the examination for the membership of the Royal College of Surgeons of England and for the Licence of the Society of Apothecaries. After qualifying, he secured the position of Resident Dresser on board the hospital ship *Dreadnought*, which for many years lay anchored at Gravesend. In 1865 he became Surgeon on a sailing ship, the *Orient*, which carried him to Adelaide. On his arrival he acted on the advice of Dr. Moore, the Colonial Surgeon, and accepted the position of Assistant Surgeon at the Burra Burra Mine. He held this position for approximately nine months, and in October, 1866, he was appointed Assistant Colonial Surgeon and House Surgeon at the Adelaide Hospital. Earlier in the year the latter position had been offered him, but he stood aside in favour of a colleague. In 1868 he started private practice at Riverton. Four years later he took a voyage to England on account of ill-health, and returned in 1873. From that time until 1905 he practised in Adelaide in King William Street South, having secured the practice of Dr. Davies. Early in this period his field of activity extended in all directions. He attained immense popularity, not only among the citizens of the Southern State, but also among his colleagues. For a period of 31 years he was entrusted with the Treasurership of the South Australian Branch of the British Medical Association, and in due course was elected Vice-President and President. He remained a member of the Council—a very active one—for several years after having filled the premier office. He held several public appointments of importance, among which may be mentioned that of Surgeon to the Home for Incurables at Fullarton and Examiner for the St. John's Ambulance Association in South Australia. He was created a Knight Grand Cross of the Order of St. John of Jerusalem in recognition of his services to the Ambulance Association.

In the year 1869 he married the daughter of Mr. Alfred Hardy, of Glen Osmond. His happy married life synchronized with his active medical life. Shortly after he retired in 1905 his wife died. He leaves four sons and four daughters. Two of the former are medical practitioners, who have maintained the high reputation of his respected name.

DAVID SKINNER.

David Skinner was born in April, 1855, at Inveraray. He received his medical education at the Aberdeen University and distinguished himself as a student. At the age of 24 he graduated as a Bachelor of Medicine and Master of Surgery. He also secured the degree of Master of Arts. In his final examination in medicine he carried off the gold medal. Shortly after graduation he proceeded to Australia, and, on arrival in Victoria, became Resident Medical Officer at the Alfred Hospital, Melbourne. At a later date he held a similar position at the Stawell Hospital, and in 1881 was appointed Junior Medical Officer at the Kew Lunatic Asylum. In the following year he started practice at Beechworth, and rapidly attracted to himself a large clientèle. He was appointed Medical Officer of Health to the Shire and Surgeon to the Beechworth Hospital. He practised continuously at Beechworth for 36 years. As announced in our issue of August 17, 1918, he suffered a short illness, and died on August 7. He was a greatly respected member of the Victorian Branch of the British Medical Association.

JAMES HERBERT IVEY INGHAM.

James Herbert Ivey Ingham, whose death at St. Kilda, Victoria, was announced in *The Medical Journal of Australia* of August 17, 1918, was born at Ballaarat on February 1, 1876. He was the son of the late Reverend J. H. A. Ingham. He was educated as a boarder at Wesley College, Melbourne, and during his medical course was in residence at Trinity College, Melbourne. He qualified with honours in 1899, and served as Resident Medical Officer at the Melbourne Hospital during the year 1900.

Leaving the Melbourne Hospital early in 1901, he commenced practice at Werribee. After two years of good work there his health, which was never robust, owing to asthma, broke down, the culmination being a severe attack of broncho-pneumonia.

As his health prevented him from remaining in the vicinity of Melbourne, his search for a suitable climate led him in 1904 to Dimboola, in the Wimmera, where he remained up to within a few days of his death. There he built a thoroughly up-to-date private hospital, and came to be recognized as one of our ablest provincial surgeons.

He was a man of strong character and the highest ideals, which earned for him the admiration and respect of all with whom he came in contact. The people of Dimboola have inaugurated a movement to provide a permanent memorial of his work among them.

The following have been elected members of the New South Wales Branch of the British Medical Association:—

John Richard Talbot, L.R.C.P., Irel., 1908; L.R.C.S., Irel., 1908, 220 Glebe Road, Glebe.

William Angwin Edwards, M.B., Ch.M., 1914, Univ. Sydney, "Craignish," Macquarie Street, Sydney.

Wilmot Fenwick, M.B., 1915, Univ. Sydney, 33 Cameron Street, Leichhardt.

Proceedings of the Australian Medical Boards.

NEW SOUTH WALES.

The following have been registered under the provisions of the *Medical Act, 1912 and 1915*, as duly qualified medical practitioners:—

Fleming, James Hamilton, Lic. R. Coll. Phys. Edin., 1899; Lic. R. Coll. Surg. Edin., 1899; Lic. Fac. Phys. Surg., 1899.

Additional Registration:—

Hudson, Alfred Roy, Mast. Surg., 1918, Univ. Sydney.
Edye, Benjamin Thomas, F.R.C.S. Eng., 1915.

Medical Appointments.

Dr. L. L. Snow (B.M.A.) has been appointed Government Medical Officer at Emmaville, New South Wales.

For the purposes of the *Workmen's Compensation Act, 1916*, New South Wales, Staff-Surgeon H. J. W. Brennand (B.M.A.), District Naval Medical Officer, has been appointed a Medical Referee for the State of New South Wales.

The appointment of Dr. Norman Dowling (B.M.A.) as Visiting Surgeon to Young Gaol, New South Wales, takes effect from September 1, 1918.

Dr. J. I. M. Jamieson (B.M.A.) has been appointed a Medical Referee for the purposes of the *Workers' Compensation Act of 1916* for the whole of the State of Queensland.

Dr. C. De Wolfe Heard has resigned his position as Third Assistant Medical Superintendent, Hospital for the Insane, Goodna, Queensland.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xv.

In future, no advertisements inviting applications from medical practitioners for positions in public institutions will be accepted unless the appointment is limited to medical practitioners who are ineligible for military service, or who have returned from military service. The term "ineligible for military service" is used to signify practitioners who are above military age, those who have offered their services and have not been accepted by the military authorities, or those who, for valid reasons, are incapable of applying for a commission in the Australian Army Medical Corps.

Renwick Hospital for Infants, Sydney, Honorary Assistant Physician, Resident Medical Officer.

Children's Hospital, Perth, Assistant Resident Medical Officer.

Medical Appointments.

IMPORTANT NOTICE.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
VICTORIA. (Hon. Sec., Medical Society Hall, East Melbourne.)	All Friendly Society Lodges, Institutes, Medical Dispensaries and other contract practice. Australian Prudential Association Proprietary, Limited. National Provident Association. Mutual National Provident Club.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Australian Natives' Association. Brisbane United Friendly Society Institute. Townsville Friendly Societies' Medical Union. Cloncurry Hospital.
SOUTH AUSTRALIA. (Hon. Sec., 8 North Terrace, Adelaide.)	Contract Practice Appointments in South Australia. Contract Practice, Appointments at Renmark.
WESTERN AUSTRALIA. (Hon. Sec., Health Department, Perth.)	All Contract Practice Appointments in Western Australia.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Australian Natives' Association. Balmain United F.S. Dispensary. Canterbury United F.S. Dispensary. Leichhardt and Petersham Dispensary. M.U. Oddfellows' Med. Inst., Elizabeth Street, Sydney. Marrickville United F.S. Dispensary. N.S.W. Ambulance and Transport Brigade. North Sydney United F.S. People's Prudential Benefit Society. Phœnix Mutual Provident Society. F.S. Lodges at Casino. F.S. Lodges at Lithgow. F.S. Lodges at Parramatta, Auburn and Lidcombe. Newcastle Collieries — Killingworth, Seaham Nos. 1 and 2, West Wallsend.
TASMANIA. (Hon. Sec., Macquarie Street, Hobart.)	Medical Officers in all State-aided Hospitals in Tasmania.
NEW ZEALAND: WELLINGTON DIVISION. (Hon. Sec., Wellington.)	Friendly Society Lodges, Wellington, N.Z.

Diary for the Month.

Sept. 4.—Vic. Branch, B.M.A.
Sept. 6.—Q. Branch, B.M.A.
Sept. 10.—Tas. Branch, B.M.A., Council and Branch.
Sept. 10.—N.S.W. Branch, B.M.A., Ethics Committee.
Sept. 11.—W. Aust. Branch, B.M.A.
Sept. 12.—Vic. Branch, B.M.A., Council.
Sept. 12.—Last Day for Nomination of Candidates representing N.S.W. Branch for election on the Federal Committee.
Sept. 13.—S. Aust. Branch, B.M.A., Council.
Sept. 13.—N.S.W. Branch, B.M.A., Clinical.
Sept. 17.—N.S.W. Branch, B.M.A., Executive and Finance Committee.
Sept. 18.—S. Sydney Medical Association (N.S.W.).
Sept. 20.—Q. Branch, B.M.A., Council.
Sept. 24.—N.S.W. Branch, B.M.A., Medical Politics Committee; Organization and Science Committee.
Sept. 25.—Vic. Branch, B.M.A., Council.
Sept. 26.—S. Aust. Branch, B.M.A.
Sept. 27.—N.S.W. Branch, B.M.A., Election of Two Members of Federal Committee.

EDITORIAL NOTICES.

Manuscripts forwarded to the office of this Journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to *The Medical Journal of Australia* alone, unless the contrary be stated.

All communications should be addressed to "The Editor," *The Medical Journal of Australia*, B.M.A. Building, 30-34 Elizabeth Street, Sydney, New South Wales.